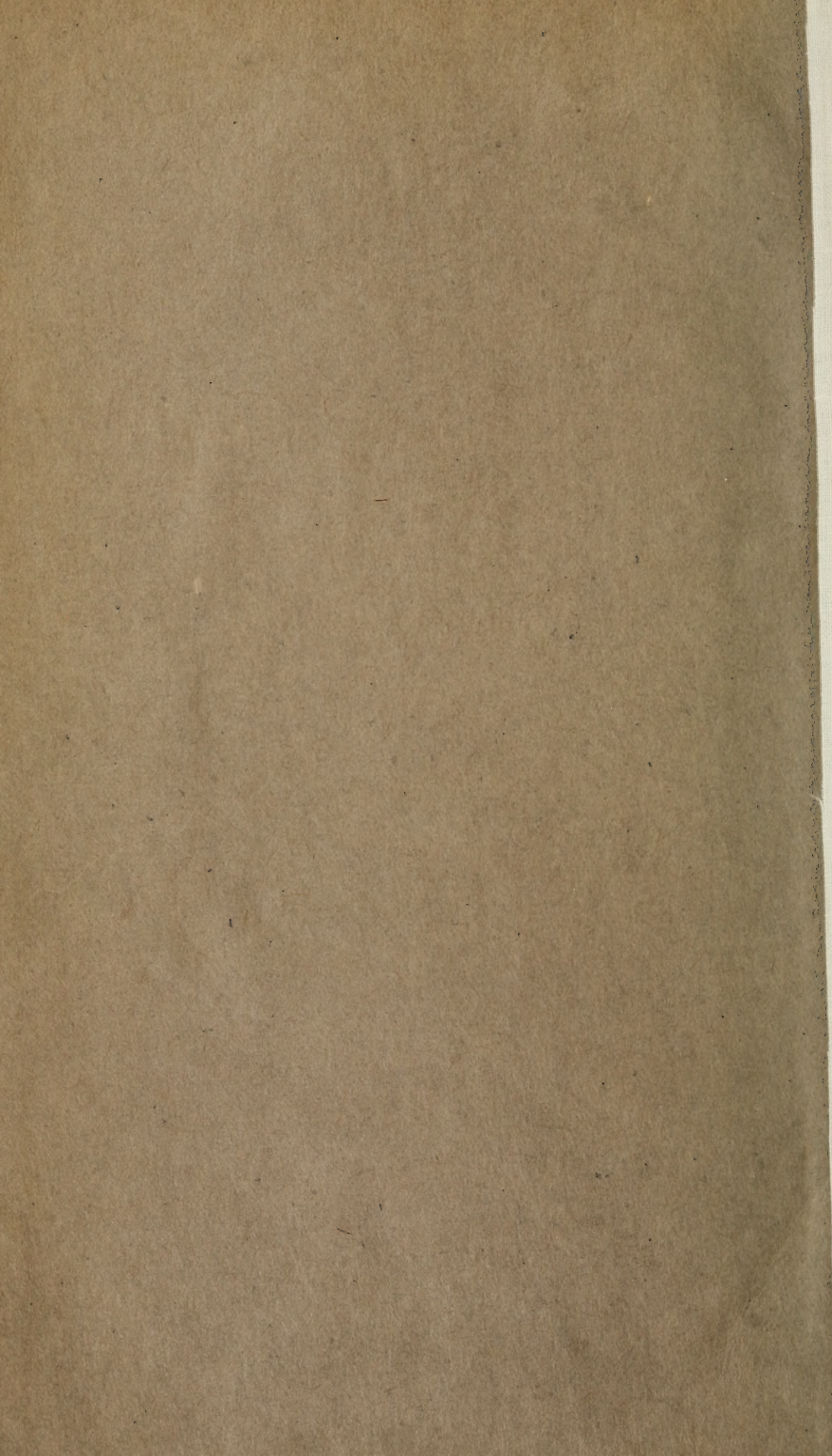


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**DANIEL LOGAN**

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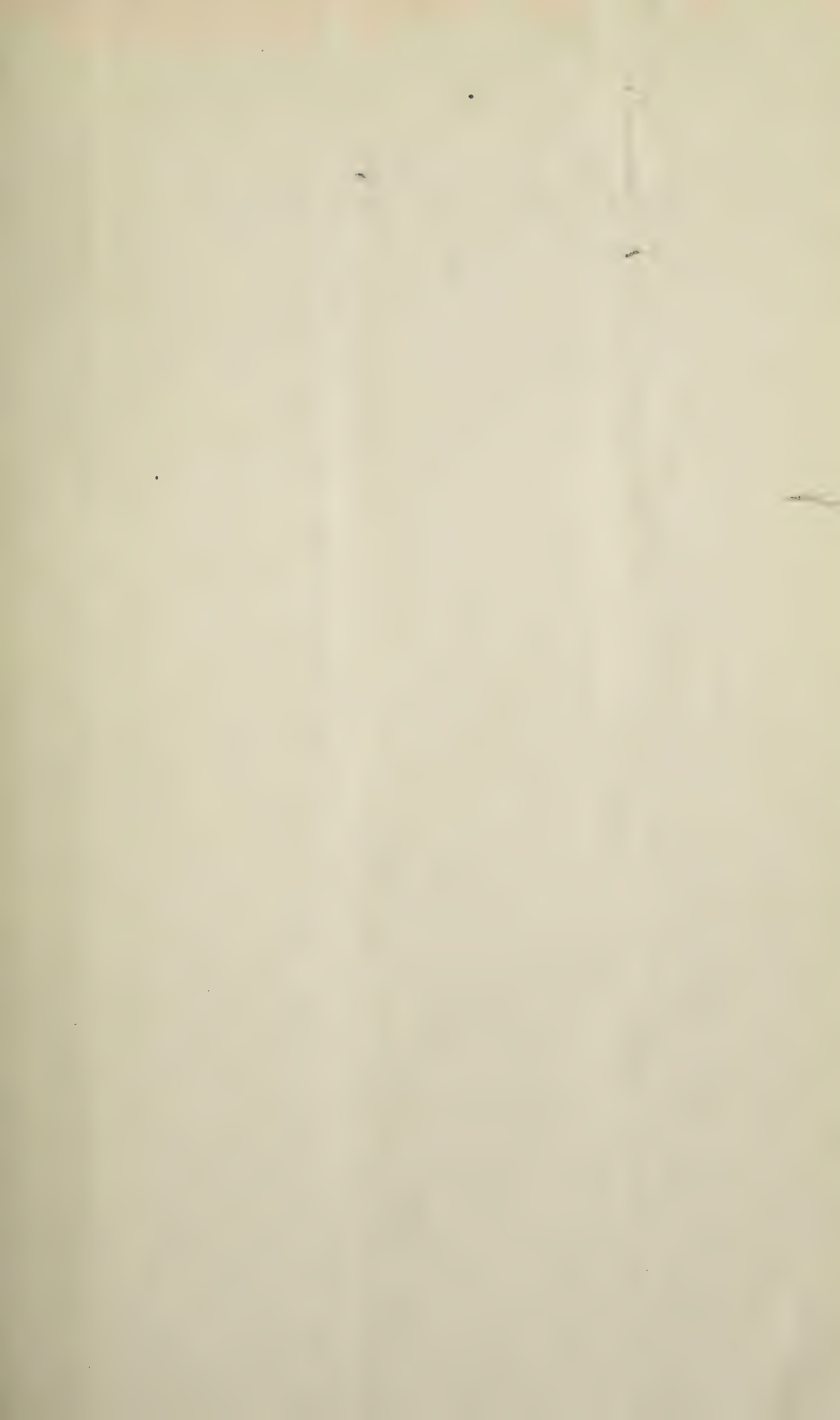
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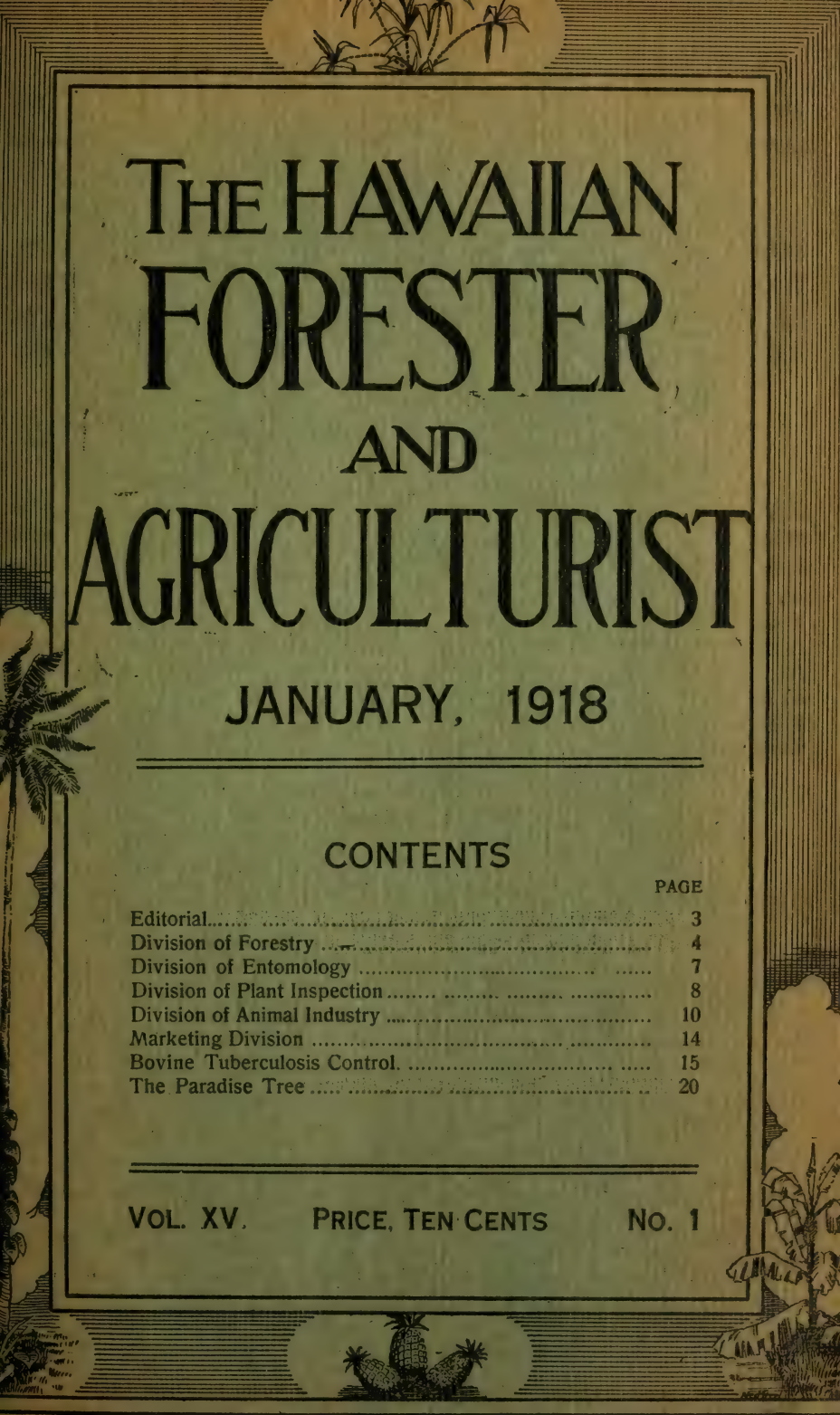
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# The Hawaiian Forester and Agriculturist

A Monthly Magazine of Forestry,  
Entomology, Animal Industry  
and Agriculture.

Issued under the direction of the Board  
of Commissioners of Agriculture  
and Forestry, Territory of Hawaii.



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# Board of Agriculture and Forestry

## DIVISION OF FORESTRY.

### FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

## PUBLICATIONS FOR DISTRIBUTION.

The Board of Commissioners issues for general distribution to persons in the Territory, annual reports, bulletins, circulars, copies of its rules and regulations, and other occasional papers, which may be had, free, upon application.

A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.



# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

HONOLULU, JANUARY, 1918.

No. 1

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The Division of Plant Inspection is now located near the waterfront, having moved into the recently completed concrete buildings on Kekuanaoa street at the last of the year. The main building contains offices, laboratory, plant inspection room and quarantine room arranged conveniently for effective work, and an incinerator for disposing of all dangerous insects and refuse detected during inspections. The fumigation building contains two large rooms which can be made airtight and in which large shipments, such as rice and beans, can be fumigated. These new quarters fill a long-felt want and will facilitate the most important work of inspection to keep injurious insects and new pests out of the Territory.

The results of the establishment of the two-acre experimental plantation of the true mahogany tree, set out in Makiki Valley in December of last year, will be viewed with interest in the future. It has already been proved that this tree, which produces timber of high commercial value, will readily grow as an individual in this climate at the lower elevations. In fact, the seed obtained for present plantings is secured from a tree which has been growing in Honolulu for some years. To ascertain the character and rate of growth of this tree under close planting conditions will be of considerable value.

The Division of Animal Industry during December, 1917, tested 450 dairy animals for bovine tuberculosis and of this number all but 53 passed the test. The owners of these condemned animals have been reimbursed under the compensation act and have thereby been assisted in the purchase of new healthy stock to replace those destroyed. The testing of dairy animals is progressing rapidly and it is hoped that bovine tuberculosis in the Territory will soon be a thing of the past.

This is the opportune time for all good citizens to help out in the food situation by an increased consumption of island-produced foodstuffs. By making island beans, sweet potatoes and bananas a larger part of one's daily diet a great deal can be accomplished toward saving on the food which is imported into the Territory. The present campaign for a greater and more

extensive use of the local banana should be heartily taken up by everyone, especially in view of the fact that on account of lack of shipping facilities bananas are now so plentiful in the market.

## Division of Forestry

Honolulu, January 11, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN: I respectfully submit the following routine report of the Division of Forestry for the month of December, 1917:

### TREE PLANTING.

The planting and caring for trees on the Honolulu Watershed Reserve was continued during the month and included the setting out on the Makiki slopes of 250 koa trees and in the bottom of the larger Makiki Valley of 1484 mahogany trees, *Swietenia mahogani*. These latter were planted 8 by 8 feet apart on an area of about  $2\frac{1}{4}$  acres and consisted mostly of large trees which had accumulated at the nursery. This experiment was initiated in order to determine the suitability of this tree for general planting in similar situations.

The work on government lands in Manoa Valley consisted in cleaning the rank growth of weeds and grass from around the koa and other trees already planted.

On the Kealia Reserve, Kauai, Ranger Lovell planted out 900 silk oak trees during the month.

On December 3, I attended the annual session of the Hawaiian Sugar Planters' Association at which the subject of the protection and maintenance of watershed forests was discussed. It was brought out that this is a very important work and the association went on record as being strongly in favor of it and willing to assist and cooperate with the government in the protection of such forests.

Post card requests have been sent out to all tree planters in the Territory in order to ascertain the number and kinds of trees planted during the year 1917 and the purpose of planting.

### FENCING.

On account of the shortage of labor the completion of the fence between Piha and Maulua, Hilo Forest Reserve, Hawaii, which is being built in coöperation with the Kukaiau Ranch Company, has been somewhat delayed and an extension of two months on the contract, or until February 28, 1918, has been granted.



## LANAI TRIP.

The last few days of the month were spent on the island of Lanai where, as yet, I had not had a chance to become acquainted with forest conditions. I had the opportunity on this trip of getting pretty well over the island and conferred with the local manager on the forest problems, giving advice on forest protection and reforestation. The preservation of the native forest in the wet region on Lanai, including the riddance of all wild stock, is essential to the scanty water supply on that island and it is necessary that the steps which have already been taken in this direction should be continued. The protection of the dry native forest on the ridge toward the west end of the island is also desirable because of the protection which it affords against wind erosion. The results of the successful reclamation of bare lands by the planting of manienie grass were also carefully examined with the view of applying this method to similar land on Kahoolawe when the proper time comes.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

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REPORT OF FOREST NURSERYMAN.

Honolulu, January 11, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR: I herewith submit a report of the work done during the month of December, 1917:

NURSERY.

*Distribution of Plants.*

	Transplant Boxes	Pot Grown	Total
Sold .....	175	24	199
Gratis .....	1275	1000	2275
Total .....	1450	1024	2474

## COLLECTIONS.

*Government Realizations.*

Collections on account of plants sold.....	\$ 2.30
"      "      "      "      seed      "      .....	2.00
Rent of office building, Nursery grounds.....	35.00
Total .....	<u>\$39.30</u>

*Preservation Forest Reserves.*

(For Quarter Ending December 31, 1917.)

Derived from rent of certain parcels of land within the forest reserves .....	\$44.00
Sale of 57 loads of black sand from Makiki Valley sand pit at 25c.....	14.25
Total .....	<u>\$58.25</u>

*Plantation Companies and Other Corporations.*

The distribution of plants under this heading amounted to 60,000 in seed boxes and 4700 in transplant boxes, total 64,700. We have still on file orders for 205,000 plants. These we expect to ship about the end of January.

*Makiki Station.*

The work at this station has been principally routine consisting of mixing and sterilizing soil, potting and transplanting trees, etc.

*Honolulu Watershed Planting.*

The total number of trees planted during the month amounted to 1734, consisting of 1484 mahogany (*Swietenia mahogani*) and 250 koa. The mahogany trees were planted the Ewa side of Makiki main valley about a quarter of a mile above the quarters, while the koa trees were planted a little higher on the opposite or south side of the valley.

*Advice and Assistance.*

The writer has been asked to make calls and otherwise give advice and assistance as follows:

Calls made, 5; advice by telephone, 10; advice by letter, 4; advice given at Nursery, 12.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

# Division of Entomology

Honolulu, December 31, 1917.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN: During the month of December the insectary handled 35,300 pupae of the melon fly, from which there were bred 933 females and 764 males, *Opius fletcheri*.

The distribution of parasites was as follows:

## *Opius fletcheri*.

	Females	Males
Oahu: Kailua .....	1237	890

## *Diachasma tryoni*

Oahu:		
Manoa .....	300	175
Kalihi .....	25	10
Nuuanu .....	100	75

## *Diachasma fullawayi*.

Oahu:		
Manoa .....	100	125
Kalihi .....	20	10

## *Tetrastichus*.

Oahu:		
Manoa .....	200	
Nuuanu .....	300	

## *Chalcid*.

Oahu: Nuuanu.....	200
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## *Paranagrus* (Corn Leaf Hopper Parasite)

Oahu:		
Makiki Nursery .....	500	
Kailua .....	5900	
Maui: Haiku.....	9000	
Kauai:		
Kealia .....	2000	
Lihue .....	10600	
Waimea .....	200	

Respectfully submitted,

DAVID T. FULLAWAY,  
Entomologist.



# Division of Plant Inspection

Honolulu, December 31, 1917.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN: I respectfully submit my report of the work done by the Division of Plant Inspection for the month of December, 1917, as follows:

During the month there arrived at the port of Honolulu 52 vessels of which 19 carried vegetable matter with the following results:

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	862	17,295
Fumigated .....	7	217
Burned .....	49	49
Returned .....	6	6
Total Inspected.....	924	17,567

Of these shipments 17,239 packages arrived as freight, 175 packages as baggage and 153 packages as mail matter.

## RICE AND BEAN SHIPMENTS.

During the month 8055 bags of rice and 1337 bags of beans arrived from Japan and Oriental ports, all of which were free from pests.

## PESTS INTERCEPTED.

Approximately 4371 pieces of foreign baggage belonging to passengers and immigrants from foreign countries were examined and from these were seized and destroyed by burning 37 lots of fruits and 10 lots of vegetables.

The following disposal was made of plants and seeds from various sources:

On December 5, a package of chestnuts from Japan was returned as unmailable.

On December 7, 200 coconuts and six birdnest ferns from Fanning Island were fumigated and packing destroyed on account of indications of a *lepidopterous* borer and some scale insects.

On December 12, a package of tree seeds from Japan in the baggage was burned as the owner did not call for same, and five-needle pine tree was sent back on board the steamer, it being contraband under rulings of the Federal Horticultural Board. One fruit tree and some palm seeds from Japan also in the baggage were fumigated as a precaution. A package of ginseng roots from Korea and a package of chestnuts from

Japan were found in the mail and returned by the postmaster as unmailable.

On December 13, a small box of oranges came from Japan by parcels post and was seized and destroyed, being prohibited from entry under rules of the Federal Horticultural Board.

On December 17, a package of bulbs from Portugal was returned as unmailable.

On December 25, one package of butternuts from Canada and one package of bulbs from the Azores were returned as unmailable. A package of tree seeds for the U. S. Experiment Station was fumigated as a precaution.

On December 28, seven ornamental plants were found in the baggage from Japan, also one package of bulbs; these were fumigated and all soil and packing removed and destroyed.

#### HILO INSPECTION.

Brother M. Newell reports the arrival of four steamers, three of which carried vegetable matter consisting of 143 lots and 3762 packages of fruits and vegetables. All were passed as free from pests.

On December 15, the steamer Seiyo Maru arrived direct from Japan bringing 2800 bags of rice, 259 bags of beans, 10 bags of peas, 12 bags of sesame seed, 4 packages of yams and one package of vegetable seeds, a total of 3086 packages, all of which were found free from pests.

#### KAHULUI INSPECTION.

Mr. Will J. Cooper, Plant and Fruit Inspector for Maui, reports the arrival of three vessels at the port of Kahului, one of which brought vegetable matter consisting of 11 lots and 771 packages, all of which were passed as free from pests.

#### INTER-ISLAND INSPECTION.

Fifty-four steamers plying between Honolulu and other island ports were attended to, and the following shipments were passed as free from pests:

Taro .....	714 bags
Vegetables .....	210 packages
Plants .....	119    "
Fruit .....	11     "

Total inspected.....1054 packages

Four packages of plants and eight packages of fruit were seized and refused shipment on account of infestation and undesirable soil.

Respectfully submitted,

E. M. EHRLHORN,  
Chief Plant Inspector.

## Division of Animal Industry

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Honolulu, January 14, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN: I regret to report that a disease which may prove to be glanders has made its appearance among the work animals on a plantation in the Hamakua district on Hawaii. The deputy Territorial veterinarian for the Kohala district, Dr. Rowat, visited the place, Dr. Elliot being too sick to attend, diagnosed the disease as glanders and destroyed two affected animals. Dr. Rowat had previously, during the early part of 1917, reported a few scattered cases of glanders in a pasture on one of the Kohala plantations, but with the destruction of these it was hoped that the outbreak had been permanently checked. The Hamakua cases, however, put a more serious aspect on the situation as they would seem to indicate the existence of a center of infection which must be located without delay. Though no information to that effect has reached this office there is a possibility that the disease may have recrudesced in Waipio Valley and is now being scattered by pack animals over the neighboring districts. It will be recalled that the last outbreak of glanders in the Territory of any importance occurred in Waipio Valley in 1912 when 34 head of horses were destroyed after many other horses and at least 12 mules had died. Previous to that outbreak a similar epidemic had occurred in the same place in 1907. In both cases it was fully believed that the disease had been stamped out of the valley, as every horse, mule and donkey had been carefully examined or mallein tested and all reactors destroyed. In the 1912 outbreak the infected stables even were totally destroyed, new ones built on virgin soil, and several subsequent inspections failed to show any additional cases. At the same time the plantations and ranches bordering upon the roads leading from the mouth of Waipio Valley were warned to keep a sharp lookout for suspicious animals among the pack trains carrying rice and paiai from the valley to the merchants in the neighborhood.

It is now five years since the 1912 outbreak, or practically the same period of immunity as followed the 1907 outbreak. The only difference is that the 1912 outbreak remained confined to the Valley and was reported by the manager of the Kukuihaele plantation before it had spread to the neighborhood.

On the basis of these facts it is recommended that a thorough investigation be undertaken by this office in order that all centers of infection may be located and eliminated. Glanders is the most destructive disease of horse stock known to agriculture and commerce as well as to the mounted and artillery service of the



Army. For the past five years we have believed ourselves free of the infection and it is still hoped that the cases reported may prove to have been *epizootic lymphangitis* or some other disease simulating glanders. But in any case a thorough investigation will require more time than it would seem advisable to have the Hilo deputy (Dr. Shipman) spend away from the district where his services are required daily, as it may necessitate the mallein testing of a great number of animals. One single "carrier"—a horse infected with glanders but showing no physical symptoms of the disease—may prove the cause, and may also prove difficult to locate.

At the same time there are a couple of hundred milch cows to be tuberculin tested in the same district which will offer an opportunity to demonstrate to both the Hilo and the Kohala deputies the working of the bovine tuberculosis compensation act.

If agreeable to the Board it is therefore recommended that I be authorized to leave for Hawaii on the 19th in order to carry out the work herein described.

In regard to the Kauai situation and the difficulties which had developed between Dr. Golding and the management of Princeville Plantation Company's ranch, the same have now been satisfactorily adjusted. The management has agreed, without further delay, to build a fence between their property and Mr. Burk-meyer's, to cancel the bill for \$500.00 for board and lodging of the veterinarians of this Board who have been stationed on the ranch on account of the anthrax work, as well as a minor bill for the use of two rolls of barbwire. It has further been decided to re-vaccinate all stock on the ranch during the month of February, the Board to supply the vaccine it still has on hand but the Plantation Company to purchase what may be required in excess thereof. Dr. Golding will remain stationed at Hanalei, but will, since his appointment as Deputy Territorial Veterinarian effective January 1st, 1918, have to assume the tuberculin testing under the compensation act, as well as respond to any call where an infectious disease may be suspected, regardless of locality. Under these conditions he may have to do a considerable amount of traveling which I fear cannot be done economically with the old Ford machine supplied him by this Board. When sent to him in August, 1917, the machine had gone more than 18,000 miles, since which time, for want of saddle horses, he has had to do nearly all his inspections of the infected pastures in the machine. This has not improved it and while the engine is still good it is very doubtful whether it would pay to have it put in serviceable condition. It is therefore recommended that a new Ford machine be supplied for Dr. Golding's use until such time as he may be able through the acquirement of private practise to afford a car of his own. Dr. Golding has now been licensed by the Board of Veterinarian Examiners to practise his profession in the Ter-

ritory and will, as he is well thought of, undoubtedly be able thereby to better himself financially before long.

It is suggested that the new car might be paid for in part from the tuberculosis compensation fund as it will be used principally in testing the dairy cattle on Kauai.

#### BOVINE TUBERCULOSIS ERADICATION.

From the appended report of the Assistant Territorial Veterinarian it will be seen that the work of testing the dairies and appraising and destroying the reacting animals is progressing fast on this island. With the single exception, dealt with in a special report of even date, there has been general satisfaction with the way in which the compensation act has worked out. The heaviest loser during the month, for instance, with 33 head condemned out of 67, realized through the compensation act sufficient capital to allow him to purchase an almost equal number of healthy cows wherewith to replace the destroyed ones.

Such, however, is not always the case, but nearly all the condemned animals were but slightly affected and when they were butchered a temporary shortage of beef had driven the meat prices up. But nevertheless this compensation for condemned animals has given new impetus to the tuberculosis eradication and it is hoped will lead to a successful finish before the allotted appropriation has been exhausted.

Respectfully submitted,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.

#### REPORT OF ASSISTANT VETERINARIAN.

Honolulu, December 31, 1917.

Dr. Victor A. Nörgaard, Chief, Division of Animal Industry.

SIR: I have the honor to submit the following report for the month of December, 1917:

#### *Tuberculosis Control.*

The following dairy animals have been tested during the past month:

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
Fred Luning.....	31	25	6
Y. Yamashita.....	67	34	33
M. T. Brazon.....	40	39	1
Y. Tsuda .....	32	32	0
A Compos.....	11	11	0
J. Gonzallos.....	15	15	0
J. Simon.....	38	36	2

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
J. Podrodia .....	17	17	0
H. Domingo.....	5	5	0
M. Solado .....	13	12	1
R. A. Franco.....	18	18	0
John Alias .....	22	22	0
S. Hirata .....	32	31	1
S. Saiki.....	10	8	2
M. Nishimoto .....	22	22	0
K. Fugisuya.....	26	24	2
R. Compos.....	9	9	0
C. H. Bellina.....	1	0	1
A. Pacheco.....	39	35	4
C. H. Cooke.....	1	1	0
E. H. Brown.....	1	1	0

The above tabulated list gives a total of 450 animals tested out of which number 397 were passed and tagged and 53 condemned and branded.

The condemned animals were appraised and slaughtered in conformance with the provisions of Act 121 of the 1917 Session Laws.

With the exception of one entire carcass and two fore-quarters which were condemned as unfit for human consumption, the above animals were passed as beef.

Lesions of tuberculosis of varying extent were found in all the condemned animals except one. In this one case no macroscopic lesions could be demonstrated in any of the organs usually affected. A more exhaustive examination of the carcass would undoubtedly have brought to light some small lesion, but this could only be accomplished by destroying its beef value. What infection was in this animal was of very recent origin. In this same herd one fore-quarter of one carcass was condemned because of extensive tubercular lesions and in another lesions were found in the supra-mammary glands and upper portion of the udder.

Owing to excellent prices obtained for these carcasses a comparatively small amount was drawn from the compensation fund for the purpose of reimbursement.

#### IMPORTATIONS OF LIVESTOCK.

S. S. China, Orient: 2 monkeys, K. A. Regum.

S. S. Lurline, San Francisco: 1 Holstein bull, 1 Jersey bull, Waialae Ranch; 1 horse, Major H. C. Gibner; 1 dog, C. H. Crank; 1 ct. turkeys, 29 shorthorn bulls, 4 horses, 1 Berkshire boar, H. M. von Holt; 1 bx. live birds, 1 bx. parrots, 3 cts. chickens, 58 cts. poultry, W. F. X. Company.



S. S. Makura, Sydney: 1 dog, Mr. Gill.

S. S. President, San Francisco: 1 ct. chickens, W. F. X. Company.

Respectfully submitted,

LEONARD N. CASE.

Assistant Territorial Veterinarian.

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## Marketing Division

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Honolulu, January 15, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu,  
T. H.

GENTLEMEN: I have the honor to submit below the report of the superintendent of the Marketing Division for the month ending December 31, 1917.

More consignments were received during the month of December than during the previous month, but due to the scarcity of beef and the closing of the retail departments, the total sales were less. Large shipments of Maui beans were received during the month but only a few sacks have been sold in Honolulu, as the dealers claim that they have no call for them. Shipments to the Coast were delayed at the request of Mr. J. F. Child, who assured us that the local dealers could handle the whole crop. A fair offer has been made by a representative of a California canning company, for from two to four thousand sacks and, unless as good an offer is received from local dealers, the beans will be shipped as soon as they can be gotten together and steamer space can be secured.

The condition of the beef market has been bad during the month. Shipments of cattle and island dressed beef have been small and uncertain. Dressed beef from California can not always be gotten on account of the limited cold storage space.

Bananas and sweet potatoes are very plentiful now and the growers of these products are losing large sums of money through not being able to sell their crop. A regulation by the Federal Food Commission requiring dealers to sell as many sweet potatoes as Irish potatoes until the crop is disposed of would put an end to the trouble. I would request that, if the Board is of the same opinion, they so inform the Federal Food Commission.

The \$500 balance due on the \$3000 note to the Bank of Hawaii was paid December 31. From now on the Division should have about \$500 to place to the credit of surplus. Part of the surplus could be used to replace the two trucks now in use at the Division.

These trucks are not worth the cost of having them overhauled and I would recommend that they both be turned in on new ones.

Due to the fact that we are breaking in a new bookkeeper, our monthly statement is not ready, but it will be submitted as soon as possible.

Respectfully submitted,

O. B. LIGHTFOOT,  
Acting Superintendent.

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## Bovine Tuberculosis Control

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Honolulu, January 14, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :—At a meeting of the Board of Supervisors of the City and County of Honolulu held on December 28, Supervisor Bellina, if quoted correctly by the daily papers, voiced some strong sentiments against the continuation of our efforts to eradicate bovine tuberculosis. Among the assertions attributed to Supervisor Bellina the following would seem to call for a reply even though no official communication substantiating these very serious charges has been received:

"Every herd on the island is suffering from tuberculosis and it cannot be eradicated." (*Advertiser*, Dec. 29, '17.)

\* \* \* every drop of milk consumed by the people of Honolulu at the present time, with the exception of that which is pasteurized, contains tuberculosis." (*Ibid.*)

\* \* \* the test carried out by Dr. Nørgaard and the Board of Agriculture and Forestry is a farce and a scandal and is forcing the poorer dairies out of business." (*Ibid.*)

\* \* \* the Board of Agriculture and Forestry has not reduced bovine tuberculosis in milch cows in the Territory." (*Bulletin*, Dec. 29, '17.)

"We have had eleven years of this tuberculin testing and now they tell us they will put us out of business if we butt in. This compensation act is a robbery of the community. The board has not reduced bovine tuberculosis in any reasonable percentage. And we were bluffed into testing our cattle." (*Ibid.*)

The simplest way in which to refute most of these charges is by quoting a few figures from the official reports of this Division and from the records on file in this office.

Percentage of tuberculosis in the dairy herds of the City and County of Honolulu since beginning of the test:

1910 .....	22.3%
1911 .....	5.27%
1912 .....	3.81%
1913 .....	3.89%
1914 .....	2.08%
1915 .....	3.08%
1916 .....	2.08%
1917 .....	Incomplete
23 dairies	have never had a reactor.
20    "	have had but one reactor.
20    "	have had from 2 to 5 reactors.
68    "	(as compared to 23 in 1911) may now be considered clean.
9     "	are still considered infected. Of these nine, eight dispose of their milk through the Honolulu Dairymen's Association where presumably it is pasteurized, while the ninth has been recently tested and all reactors disposed of.

In regard to the Bovine Tuberculosis Compensation Act (Act 121, 1917) to which Supervisor Bellina refers in such flattering terms, it was introduced before the last legislature by the local milk producers. It leaves the Board of Agriculture and Forestry no discretion as to whether dairy cattle shall be tested or not, but decrees that the Board *shall test all dairy cattle*, etc. Such cattle shall first be appraised, and the appraised value shall be satisfactory to the owner. Supervisor Bellina, though he, for reasons of his own, opposed the passage of the bill which carries an appropriation of \$20,000, was the first to avail himself of its benefits, or, to use the words ascribed to him, having been bluffed into testing his herd, he drew \$2801.48 compensation for his condemned cattle, or 14% of the total appropriated for the entire Territory.

In regard to the war-time conservation "of the beef which is now being slaughtered as the result of tuberculin testing," Supervisor Bellina seems to overlook the fact that only three of his tuberculous cattle were so badly diseased that their carcasses had to be condemned entirely. From the rest of the carcasses the Supervisor salvaged beef to the value of \$2359.52.

The threats imputed to me in regard to "putting any dairyman out of business" are hardly worth replying to. The only dairyman I have heard of being put out of business of recent years was Mr. Farm, but possibly Mr. Bellina does not refer to him. At any rate this Board expended more than \$6,000 trying to keep him in the business, though without avail. He was driven out!

In conclusion: Is the policy of eradication of bovine tuberculosis as adopted by this Board on my recommendation sound?

On May 1, the federal Bureau of Animal Industry created the



Tuberculosis. Eradication Division. At the annual meeting of the American Veterinary Medical Association in Kansas City in August, the chief of this new division spoke as follows:

"The Bureau believes that tuberculosis may be eradicated from all the cattle and all the swine in this nation; otherwise, it would not have attempted such an arduous task."

"To support such a broad assertion there is an abundance of evidence obtained through the school of experience covering a period of several years."

"Tuberculosis has been eradicated from hundreds of herds in the District of Columbia, Virginia, Maryland, and other states. It has been practically exterminated from comparatively large circumscribed areas."

"Furthermore, wherever and whenever an effort was made to eradicate the disease and the earnest coöperation of the live stock owners and officials has been obtained, success has never failed to crown the enterprise."

"Herds of cattle which have, at the inception of the campaign, contained 75% of diseased animals, have been freed of the malady; and have remained as free herds."

"Herds which, on the first test, were found free of disease, have, by the prudent care of their owners, been kept free of tuberculosis."

"The experience the Bureau has had, as outlined here, has been enjoyed by veterinary officials of some of the states."

"The preponderance of successful experiments, if we call them such, is convincing proof that when conditions are favorable tuberculosis may be eradicated."

*"What constitutes favorable conditions?"* The same state of mind of the people that obtained in the early nineties when pleuro-pneumonia was eradicated; in 1902, 1908, 1914 and 1915, when foot-and-mouth disease was eradicated; the spirit that pervaded the western states during the cattle and sheep scabies eradication campaign; the spirit that is aiding in the eradication of hog cholera; the same state of mind, the same earnest, hearty, wholesome and substantial coöperation that has made Texas fever eradication such a success."

"The American people can eradicate tuberculosis or prevent its eradication, or increase its presence."

This unequivocal declaration of policy by the highest authority in the United States would appear in every respect to support the policy adopted by and adhered to by the Territorial Board of Agriculture and Forestry, the Territorial Board of Health and, up to the present time, the Board of Supervisors of the City and County of Honolulu. The endorsement of the people of the Territory was definitely voiced by the last legislature. And last but not least it has the unanimous support and approval of the local medical association.

As one of "the American people" who "can eradicate tubercu-

losis or prevent its eradication, or increase its presence" let us see what Supervisor, milk producer and director in the Dairy-men's Association Bellina has accomplished. Has he eradicated tuberculosis or helped to eradicate it, even from his own herd? Decidedly no. He has obstructed our efforts at eradication in every possible way, retaining his diseased cows on his dairy premises until forced to dispose of them, and he now retains a nest egg of some seventy head of untested cattle and condemned reactors, which he does not find it convenient to round up. Has Mr. Bellina prevented the eradication or increased the presence of tuberculosis? Decidedly yes! The infected herd just referred to has already caused a decided increase of tuberculosis in a neighboring dairy herd where the malady has been steadily decreasing until Mr. Bellina's diseased animals were placed alongside, with only a wire fence between the two herds, and that defective. As far as Mr. Bellina's own dairy herd is concerned he had this year (1917) more than five times as many tuberculous cattle as he had in 1916. In another herd, one of the largest in the Territory and originally one of the most infected, we had succeeded, by testing every three months, in reducing the number of tuberculosis animals from 34% in 1911 to 3% in 1915. When testing this herd for the third time in 1916 the manager informed me that Mr. Bellina had convinced him that the losses would be much smaller if he tested but once a year; and that was all the law required, anyhow! The herd was not tested again until 13 months later. The percentage had increased to 22.34%.

To further prove the fallacy of Mr. Bellina's advice the annual percentages of tuberculous animals, from 1910 to 1917 inclusive, in the said herd are appended:

1910—1 test	—41.5 %	tuberculous cattle
1911—1 "	—34. %	" "
1912—3 tests	—9.01%	" "
1913—4 "	—7.4 %	" "
1914—4 "	—4.37%	" "
1915—4 "	—3. %	" "
1916—3 "	—4.07%	" "
1917—1 test	—22.54%	" "

These figures should prove conclusively that to leave tuberculous animals in the herd for one year instead of weeding them out every 3 months does not pay, especially when the question is the eradication of the disease at the least cost to the Territory.

In conclusion, Supervisor Bellina's attention is called to Ordinance No. 17 of the City and County of Honolulu, approved March 21, 1910, and still effective. This ordinance requires the tuberculin testing of all dairy cows in the City and County of Honolulu and adds that the Board of Supervisors shall provide for the testing of the cows without charge. All tuberculin

testing in the City and County of Honolulu from March 21, 1910, until the approval of the territorial bovine tuberculosis compensation act on April 23, 1917, has therefore been carried out under authority of and in coöperation with the local Board of Supervisors of which Mr. Bellina is now a member. Beyond the fact that the supervisorial ordinance is a City and County measure and the compensation act a Territorial one, there is little difference in the scope of the two, unless it be that the latter compensates the owner of the tuberculous animals, while the former does not. This, however, can hardly have been the cause of the Supervisor's displeasure when he snapped at the bill that was compensating him.

So perhaps he was only preparing the Board of Supervisors for action on a new milk ordinance, substituting pasteurization for tuberculin testing! Again quoting the *Bulletin* of December 29, we learn: "Supervisor Bellina said that pasteurization of milk is the only way in which the disease may be eliminated." This Mr. Bellina can hardly have meant, as he must be aware that tuberculosis during 1917 increased to an alarming extent in a number of herds from which the milk was being pasteurized, or in spite of it. Pasteurization under competent official control may possibly be relied on to kill tubercle bacilli in the milk, but it most assuredly will not help controlling or even preventing the further spread of tuberculosis in infected herds. And Mr. Bellina may rest assured that should his attempt at preventing our further efforts at controlling and eradicating the disease prove successful, the time will not be distant when there will be no herd free of tuberculosis, and when scrofulosis and intestinal tuberculosis will increase among the children of the Territory.

Respectfully submitted,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.



# The Paradise Tree

A BEAUTIFUL TREE OF TROPICAL AMERICA VERY  
SUITABLE FOR HAWAII.

By VAUGHAN MACCAUGHEY, *College of Hawaii.*

The Paradise Tree is one of the most beautiful trees of tropical Florida, the West Indies, and tropical America. Many travelers and tree lovers have awarded it the highest praise for loveliness of form, foliage, flower, and fruit. It grows easily and rapidly, reproduces freely, and has very few insect or fungous enemies. Its name is euphonious. The Paradise Tree should become a member of that large and growing family of Hawaiian trees that are native to other lands, but that have become so thoroughly established in their mid-Pacific island home that they are now recognized as *kama-ainas*. The mango, the banyan, the monkey-pod, the kiawe—how empty the Honolulu lowlands would become if these trees were to vanish! The beautiful Paradise Tree should be introduced into the Paradise of the Pacific, and add its charm and tropic color to the exotic vegetation of Hawaii.

The tree (*Simaruba glauca* DC.) is a member of the Quassia family (Simarubaceæ or Simaroubaceæ), which comprises about 145 species in 28 genera. These are trees and shrubs—a few herbs—mostly tropical and generally with bitter latex. Many are of medicinal value. The name Simaruba is the Guiana natives' name for a certain species of that country. At present this important family is wholly unrepresented in the Hawaiian flora. There are no indigenous forms, and none of the foreign species have been introduced. In the continental United States the Ailanthus or Tree of Heaven, native to northern China, is widely planted and naturalized. The Paradise Tree would be a worthy representative of the family in Hawaii. Inasmuch as the trees are dioecious, and the fruit-clusters are very handsome, the female trees are much more valuable, from the ornamental standpoint, than are the male trees.

The genus *Simaruba* Aublet comprises seven species, all native of tropical America, and all characterized by bitter, resinous juice and tonic properties. The Paradise Tree ranges from southern Florida and the keys through the Bahama Islands, Cuba, Jamaica, Central America, Guiana, and Brazil. It is called Bitter-wood because of its taste. The Cuban name *Palo blanco* refers to the silvery undersurfaces of the leaves. It is often confused with *S. amara* Aublet, which is the official source of Simaruba bark.

The Paradise Tree has a beautiful form, and rises to heights of 35-50 feet. Under favorable conditions the latter stature is not uncommon. The crown is round-topped and symmetrical, with a dense canopy of very dark green glossy leaves, the under

surfaces of which, as has been mentioned, are silvery. The trunk is straight, smooth, and 18-20 inches in diameter. The bark is very smooth, .50-.75 inches thick, picturesquely patterned and mottled with light brown and brownish-gray, and finally exfoliating in broad, thick, appressed scales. In Costa Rica an infusion of the bark is used in the treatment of fever. The branches are slender and spreading. The branchlets are stout. They are pale green and glabrous when they first appear, but gradually change to light brown. In their second season they are rugose and conspicuously marked by the large, oval leaf-scars.

The wood is light, soft, not strong, and coarse-grained. It has scattered, open ducts, indistinguishable annual rings, and very fine pith rays. Its color is uniform pale yellow or light brown, with thick sapwood and intensely bitter flavor. The wood is little used, although it possesses to a marked degree tonic properties resembling those of the Quassia tree. In Florida it is popularly believed that to drink water from a cup made of Simaruba wood is a cure for chills and fever. The physical properties of the wood are as follows:

Specific gravity .....	0.4136
Percentage of ash.....	0.93
Relative approximate fuel value.....	0.4098
Coefficient of elasticity.....	93217.
Modulus of rupture.....	564.
Resistance to longitudinal pressure.....	426.
Resistance to indentation.....	86.
Weight per cubic foot.....	25.78 lbs.

The bark of the root is employed medicinally, often as a substitute for *S. amara*. It comes to the druggist in the form of long pieces, one or more inches broad, folded lengthwise, light, flexible, tenacious, very plain, light brownish yellow externally, pale yellow on the inside, rough, warty, and marked with transverse ridges; without odor. The chief constituent is quassin,  $C_{10}H_{12}O_3$ .

The leaves are alternate, abruptly odd-pinnately compound, and 6-10 inches long. The petioles are 2-3 inches long. The leaflets are conduplicate in the bud. When they first unfold they are thin, membranaceous, and dark-red. They are petiolulate; the petiolules are stout, about .25 inch long. The leaflets are alternately arranged, 11-13, mostly obovate, 2-3 inches long, margin entire and revolute, venation pinnate, texture coriaceous. The base is cuneate and more or less oblique. The apex is rounded or slightly pointed. The blade is very lustrous dark green above; below it is silvery glaucous, with a prominent midrib. The two surfaces contrast very strongly in color and luster.

In the springtime for many weeks the dark crowns of the Paradise Trees are covered with a delicate yellow veil. This diaphanous drapery which appears on both staminate and pistillate trees, is composed of the immense loose clusters of tiny yellow flowers. The individual flowers are very small (.33 inch in diameter,

.16-.25 inch long), and numerous, massed in large axillary and terminal panicles. The panicles are 12-18 inches long, 18-24 inches broad, and wide-spreading; the flowers are arranged in groups of 2-6 along the glaucous branches of the panicle. The panicle stem is pale and glaucous. As a whole the flower clusters are showy and attractive and constitute one of the important ornamental features of the tree.

The pericels are very short, stout, club-shaped and glaucous. The bracts are small, scarious, and deciduous. The flowers are dioecious. The calyx is glaucous, with 5 short lobes. The corolla has 5 petals which are pale yellow, fleshy, oblong, oval-acute, 4-5 times longer than the calyx. The corolla surrounds a hemispheric villous disk. The stamens are 10, as long as the petals, in the staminate flowers. They are free, filiform, each attached to a ciliate scale at its base and bearing an oblong introrse 2-celled longitudinally dehiscent anther attached on the back below the middle. The pistil has a deeply 5-lobed ovary, with 5 recurved styles and 5 solitary ovules.

The fruit is a sessile drupe, one inch or less in length. It is ovoid or oblong, somewhat oblique and slightly ribbed on one side. The fruits are arranged in groups of 1-5 together; when partially ripe they are bright scarlet, when fully mature they become rich glossy dark purple. The name Paradise Tree refers to these brightly colored fruit clusters, as well as to other ornamental features. The flesh is thin, bitter, and not edible. The seed is about .75 inch long, crustaceous, papillose, and orange brown. In Jamaica the fruits are called Mountain or Bitter Damsons.

The cultural requirements of the Paradise Tree are simple. A humid atmosphere; porous, thoroughly watered soil; and an abundance of well-rotted vegetable manure around the roots of the young plant—these are the main requirements. After the tree has been successfully introduced the seeds will be scattered by the birds, and undoubtedly the species will become naturalized. The Paradise Tree should belong to Hawaii.



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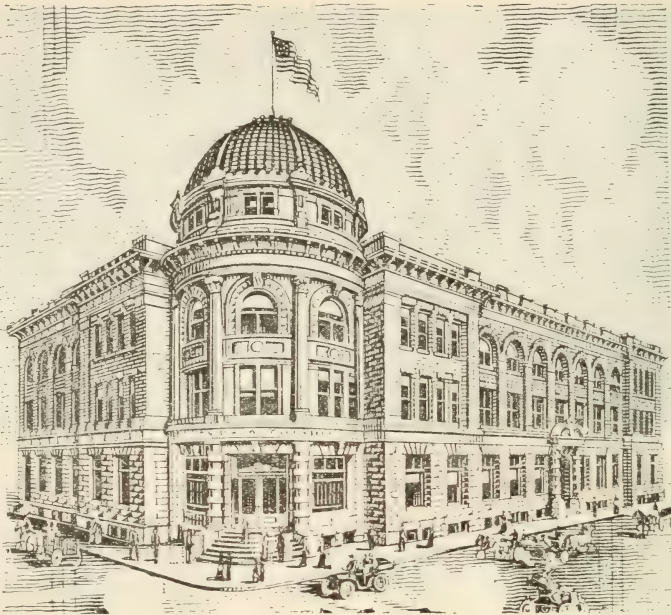
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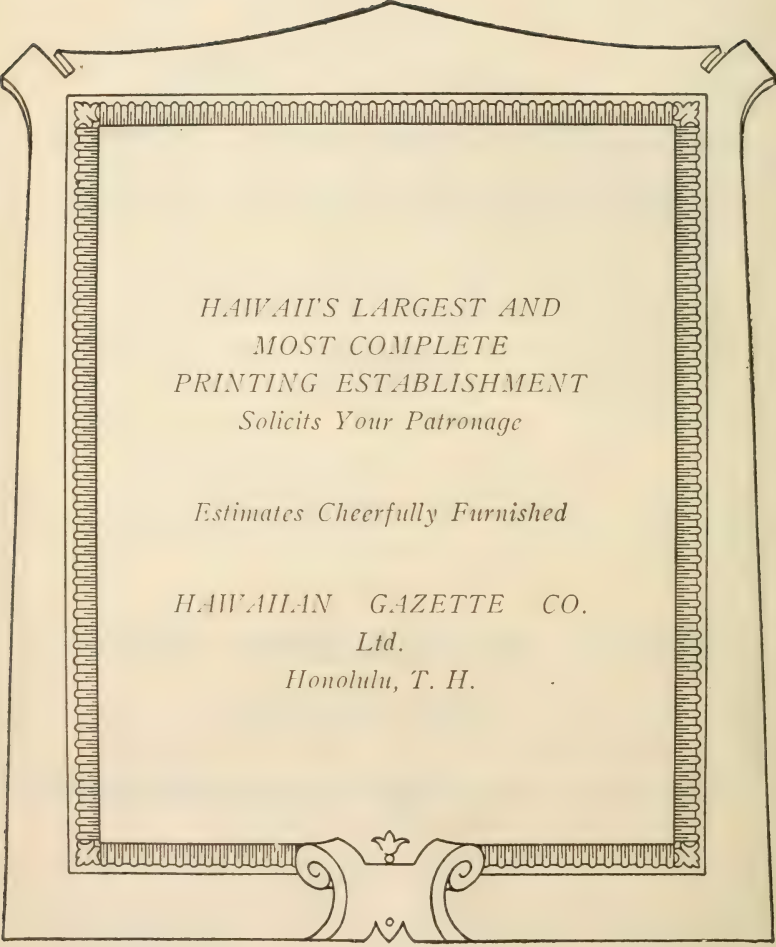
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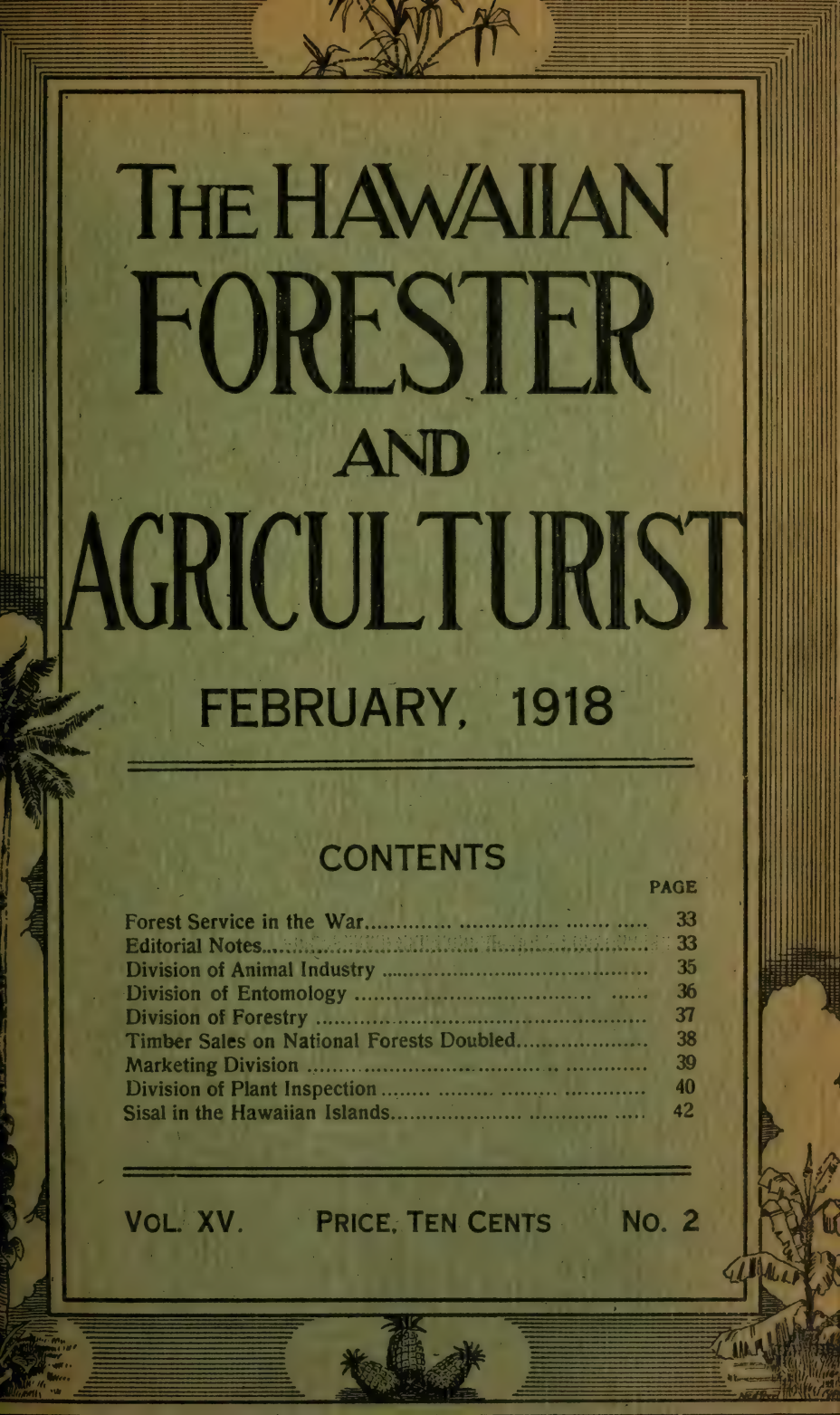
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

FEBRUARY, 1918

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All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
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To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

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## FOREST SERVICE IN THE WAR.

"Upon the rupture of diplomatic relations with Germany," says the report of the federal department, "the forest service began to plan for meeting the responsibilities which, if war followed, it should assume." Among these were emergency assistance in the protection of public works and transportation lines and the gathering of military reconnaissance information valuable to the war department.

Wood and other forest products have almost innumerable uses in modern warfare, it is pointed out. Never before has the demand for exact knowledge been so urgent. "In the work relating to forest utilization and forest products, the resources of the service have been employed to the limit of their capacity since the war began in rendering assistance to the war and navy departments, the emergency fleet corporation, various committees of the council of national defense, and manufacturers of war orders. The peace-time program has been largely discontinued. The force and the work have been centered in Washington and Madison. Every effort has been made to bring available knowledge to the attention of the organizations which have need for it and to assist in anticipating their problems."

Much of the work has concerned aircraft material. It has included also problems connected with the construction of wooden ships and of vehicles. Assistance has been given to hardwood distillation plants in order to increase the production of acetone and other products needed for munition making. A commercial demonstration has shown that costs of producing ethyl alcohol from wood waste can be materially reduced. Methods have been developed by which walnut and birch can be kiln-dried in a much reduced time with comparatively little loss. In general, the report says, "much assistance has been given on a great variety of war problems relating to forest resources and the manufacture, purchase, and most efficient use of wood and other forest products."

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Tuberculosis control among dairy cattle for January, according to the report of the Assistant Veterinarian, shows 31 animals condemned out of 870 tested, or 3.56 per cent. It will be

noticed, however, that two or three dairies account for the comparatively high showing of infection and that, taken by dairies, there are ten absolutely clean out of eighteen inspected, or 55½ per cent clean. Since Dr. Nørgaard's exposure of the true character of Supervisor Bellina's assault upon the bovine tuberculosis control policy of the Board of Agriculture and Forestry nothing has been heard of that gentleman's proposed ordinance to destroy the effectiveness of the campaign. There has not appeared a scintilla of popular backing for his retrograde scheme.

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Distribution of nearly 36,000 parasites of the fruit fly and of the corn leaf hopper in January, a large proportion of which were bred in the same month, indicates continued efficiency of the Division of Entomology. Reports of several of the sugar plantations telling of the ravages of the leaf hopper strongly emphasize the value of this service.

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Tree planting proceeds with satisfactory progress, as may be seen in the January report of the Forest Nurseryman. The work that the plantation companies are doing in this line is immense, and it is gratifying to note that the nursery is equal to the huge demands from this quarter.

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According to the January report of the Marketing Division, business in beans, cabbage and sweet potatoes was brisk. Exportation of beans to the Pacific Coast, providing it be limited to what amount may be spared without causing domestic scarcity and high prices for the commodity, distinctly adds to the prestige of Hawaiian horticulture.

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Effective protection from pests is again manifested in detail by the report of the Division of Plant Inspection for last month. Our ports are well guarded against the greatest menace to Hawaiian agriculture.

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Daily accounts in the press regarding the war conservation of certain foodstuffs in the territory gives promise that the campaign will permanently revolutionize the effort to make Hawaii self-sustaining in the matter of sustenance for man and beast both in normal times and periods of emergency.

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Henry S. Graves, the federal forester, is now serving with the American expeditionary forces in France, with a commission as lieutenant colonel, in connection with the forest work for the supply of the needs of our overseas troops and those of the Allies. A number of other members of the forest service received commissions in the Tenth Engineers (Forest) while many more entered the ranks.

# Division of Animal Industry

REPORT OF ASSISTANT VETERINARIAN.

Honolulu, February 21, 1918.

Dr. V. A. Nörsgaard, Chief, Division of Animal Industry, Bureau  
of Agriculture and Forestry,  
Honolulu, T. H.

SIR: I have the honor to submit the following report for the  
month of January, 1918:

## *Tuberculosis Control.*

The following cattle were tested during the month:

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
Moanalua Ranch.....	150	148	2
W. Miner.....	10	10	0
E. Holt.....	1	0	1
Kalihi Farm.....	42	42	0
Geo. H. Holt.....	16	13	3
V. Vasconcellas.....	20	20	0
Antone Pires.....	7	4	3
John Fernandez.....	10	10	0
Kamehameha Schools.....	37	33	4
F. Correia.....	12	12	0
Joe Caspina.....	13	13	0
C. J. Day.....	5	5	0
K. Sato.....	14	14	0
D. Telles.....	2	0	2
J. P. Mendonca.....	22	22	0
Moanalua Ranch.....	142	140	2
Kualoa Ranch.....	356	342	14
Antone Marks.....	11	11	0

The above list shows a total of 870 head tested, out of which number 839 were passed and tagged, and 31 condemned and branded. Of these 31 condemned cattle, 30 have been slaughtered at the local abattoirs, 28 being passed and 2 condemned as unfit for human consumption. On 10 of these cattle no compensation was paid, as their beef value exceeded 80% of the appraised value. Very good prices were obtained for all.

## IMPORTATIONS OF LIVESTOCK.

S. S. Manoa, San Francisco: 2 dogs, 1 cat, W. F. X. Company.  
S. S. Sierra, San Francisco: 1 cat.



S. S. Governor, San Francisco: 2 Airedale Pups, F. L. Waldron.

S. S. Hyades, San Francisco: 1 dog, Mrs. J. P. Wisser.

S. S. Lurline, San Francisco: 17 mules, Haw. Preserving Co.; 1 dog, Mrs. E. M. Magoon; 1 Berkshire boar, E. O. Hall & Son.

S. S. Manoa, San Francisco: 1 dog, W. R. Norris; 4 cts. chickens, J. C. Reed.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

## Division of Entomology

Honolulu, February 15, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN: During the month of January the insectary handled 33,100 pupae of the melon fly, from which there were bred 900 females and 709 males, *Opius fletcheri*.

The distribution of parasites was as follows:

### *Opius fletcheri*.

	Females	Males
Oahu:		
Schofield Barracks.....	160	123
Kaimuki .....	135	110
Kauai: Kealia.....	482	381

### *Diachasma tryoni*.

Oahu: Kalihi.....	40	18
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### *Diachasma fullawayi*.

Oahu: Kalihi.....	35	10
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### *Paranagrus* (Corn Leaf Hopper Parasite).

Oahu:	
Manoa Valley.....	4000
Makiki Nursery.....	14200
Maui: Haiku.....	16300

Respectfully submitted,

D. T. FULLAWAY,  
Entomologist.

# Division of Forestry

## REPORT OF FOREST NURSERYMAN.

Honolulu, January 31, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR: I herewith submit a report of the work done during the month of January, 1918:

### NURSERY.

#### *Distribution of Plants.*

	Transplant Boxes	Pot Grown	Total
Sold .....	500	94	594
Gratis .....	850	1500	2350
Total .....	<u>1350</u>	<u>1594</u>	<u>2944</u>

### COLLECTIONS.

#### *Government Realizations.*

Collections on account plants sold.....	\$ 7.30
Rent of Office Building, Nursery grounds.....	35.00
Total .....	<u>\$42.30</u>

#### *Plantation Companies and Other Corporations.*

The distribution of plants under this heading amounted to 152,000 in seed boxes and 300 in transplant boxes. We still have on file orders for 50,000 seedlings and 6000 transplants ready to set out. These orders will be completed in a few weeks.

#### *Makiki Station.*

The work at this station has been principally routine. We have a large quantity of koa and other species ready to be planted out on the Honolulu Watershed in Makiki and Manoa Valley sections.

#### *Honolulu Watershed Planting.*

During the month 406 koa trees were planted on land near the top of Makiki Valley. Other work done consisted in making holes and hoeing trees.

In Manoa Valley section of water reserve trees planted during the month consisted of the following species:

44	<i>Melalenca stypheloides</i>
137	<i>Spathodea campanulata</i>
31	<i>Pisonia inermis</i>
20	<i>Melalenca leucadendron</i>
367	<i>Acacia koa</i>
6	<i>Ficus religiosa</i>

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### *Advice and Assistance.*

The writer has been called upon to make visits and otherwise give advice as follows:

Calls made, 8; telephone advice, 10; advice by letter, 6; advice to people calling, 8.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

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### TIMBER SALES ON NATIONAL FORESTS DOUBLED.

Sales of national forest timber in the fiscal year 1917 were more than double those of 1916, according to the annual report of the forester. The total amount sold exceeded two billion feet and is valued at more than \$3,715,000. During the same period about 727 million feet were cut and removed, for which the purchasers paid \$1,507,303 into the federal treasury. The largest sales were made in Oregon, where about 688 million board feet were disposed of.

In addition to the timber sold, approximately 113 million board feet valued at almost \$150,000 was cut under free use permit by more than 41,000 settlers living near the national forests and depending on the forests for firewood and building material to improve their homesteads.

The timber business on the eastern purchase areas, while still small as compared with the western forests, showed a decided increase. More than three times as much timber was sold and more than twice as much cut as in 1916. The material disposed of, it is pointed out, is largely of poor quality and its removal will improve the forest growth.

## Marketing Division

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Honolulu, February 26, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu,  
T. H.

GENTLEMEN: I respectfully submit the following report of the Acting Superintendent of the Marketing Division for the month of January, 1918:

During the month, the Division received large shipments of beans, cabbages and sweet potatoes. Very few beans had been sold as the local market was flooded with Island beans. The Maui red bean is an excellent bean and can be readily sold on the Coast. We received an order from the Hawaii Preserving Company for all the Maui red beans we can get to be shipped before February 28. They are going to ship these beans to the Coast and, if they prove satisfactory, they will buy all the red beans we can furnish next season.

Many large shipments of bananas have been received by the Division, a good part of which were sold by the Banana Consuming Propaganda Committee and delivered by us. We are also handling large quantities of loose bananas each day, which are being used by the local bakeries, as well as by the army posts for making banana bread. Our large truck was out of commission during the time we had to make the deliveries of bananas, and it cost the Division \$185 for outside trucks.

Large shipments of very good cabbage were received from Wahiawa which we had no trouble in disposing of. Cabbage was scarce this year and large quantities had to be imported. We expect several tons more in from Maui in the near future.

Sweet potatoes were very plentiful during the month of January, but most of the consignment were received in poor condition. These potatoes had to be regraded and the worst of the lot sold as pig feed. We induced some of the local bakeries to experiment with sweet potatoes as a substitute in making bread, and this helped our sales considerably. Good bread can be made by using about 30 per cent sweet potatoes.

The Audit Company of Hawaii have a man working on our books, and as soon as they are in balance we will submit our monthly statement.

Respectfully,

O. B. LIGHTFOOT,  
Acting Superintendent.



## Division of Plant Inspection

Honolulu, January 31, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN: I respectfully submit my report of the work done by the Division of Plant Inspection for the month of January, 1918, as follows:

During the month there arrived at the port of Honolulu 62 vessels, of which 18 carried vegetable matter with the following results:

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	631	16,811
Fumigated .....	7	17
Burned .....	41	42
Returned .....	2	2
Total Inspected.....	681	16,872

Of these shipments 16,623 packages arrived as freight, 127 packages as mail matter, and 122 packages as baggage.

### RICE AND BEAN SHIPMENTS.

During the month 26,152 bags of rice and 1,214 bags of beans arrived from Japan and Oriental ports, all of which were free from pests.

### PESTS INTERCEPTED.

Approximately 2710 pieces of baggage belonging to passengers and immigrants from foreign countries were examined, and from these were seized and destroyed by burning 28 lots of fruit and 14 lots of vegetables.

The following disposal was made of plants and seeds from various sources:

On January 7, a case of plants from California was fumigated for aphid, and the soil removed before delivery.

On January 10, five orchids and a package of hibiscus cuttings belonging to passengers from Manila were fumigated as a precaution.

On January 7, a package of pomegranate seeds and a package of tree seeds in the mail from Japan were returned as unmailable.

On the same date a bag of kukui nuts in the mail from Manila was fumigated as a precautionary measure and passed.

On January 31, two bags of tree seed in the mail from Egypt were fumigated as a precaution and passed.

#### HILO INSPECTION.

Brother M. Newell reports the arrival of two steamers, each carrying vegetable matter consisting of 116 lots and 2,554 packages of fruit, plants and vegetables; all of which were passed.

#### KAHULUI INSPECTION.

Mr. Will J. Cooper, Plant and Fruit Inspector for Maui, reports the arrival of seven steamers at the port of Kahului, three of which brought vegetable matter consisting of 15 lots and 1007 parcels. No injurious pests were found, and all were passed.

#### INTER-ISLAND INSPECTION.

Fifty-eight steamers plying between Honolulu and other island ports were attended to, and the following shipments were passed as free from pests:

Taro .....	483	bags
Vegetables .....	269	packages
Plants .....	164	"
Fruit .....	14	"

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Total passed .....930 packages

Two lots of fruit were rejected on account of infestation.

Respectfully submitted,

EDWARD M. EHRHORN,  
Chief Plant Inspector.

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How the work of the federal forest service was realigned to meet war conditions is described in the annual report of the Forester, which in the absence of the head of the service is made by Acting Forester A. F. Potter. The report also states that practically every form of use of the forests was greater than ever before, that the receipts again touched a new high level with a total of \$3,457,028.41, and that the increase in receipts over the previous year was \$633,487.70.

# Sisal in the Hawaiian Islands

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By VAUGHAN MACCAUGHEY, *Professor of Botany, College of Hawaii*, and WILLIAM WEINRICH, *Fibre Expert*.

Sisal is second only to cotton in being the most extensively used fibre in the United States. Its importance as the basis of binder-twine is steadily increasing. It is a tropical crop, however, and is practically unknown to the average American farmer. The peninsula of Yucatan is the greatest sisal-producing region in the world, and supplies 90 per cent of the world's sisal.

The only important sisal-growing portion of the United States is the Territory of Hawaii. Sisal has been raised successfully in the Hawaiian Islands for over two decades, and is now firmly established as an important agricultural industry. There has been no recent or comprehensive account of the sisal industry in Hawaii, and the present paper undertakes to give an up-to-date statement concerning this valuable crop plant.

Sisal fibre owes its name to the fact that it was first exported through the port of Sisal, Yucatan, just as Manila hemp received its name from its chief shipping point. Sisal is derived from the leaves of two closely related plants,—*Agave rigida* var. *clongata* Baker, the henequen, and var. *Sisalana* Engelman, the true sisal. Both are native to Yucatan. They belong to the Amaryllis family and are similar in appearance to the ornamental agaves. The two common names for this plant are *maguey* and *century plant*. All species of this group are natives of Mexico. They furnish a variety of economic products, among which fibre, cloth, a food, soap, *pulque*, and *mescal* are prominent. The Agaves flower so infrequently in the temperate zone that they have long been known under the misleading name of "century plants".

The sisal industry was probably started in Yucatan by the Toltecs, who emigrated to Campeachy from Central America about A. D. 1060. The economic value of the fibre was quickly perceived by the early Spanish explorers, whose navy was in need of cordage to replace the depleted stores of Manila hemp (abaca). In 1783 a Spanish commission made investigations in Yucatan, reported favorably, and industrial development began. The plantations rapidly became so lucrative that the Spanish owners made every effort to maintain a close monopoly. No plants suitable for propagation were permitted to leave the country. When international courtesy demanded a few plants for research, they were treated, before shipment, so as not to grow.

However, in 1836, before the value of the sisal monopoly had been fully realized by the Spaniards themselves, Dr. Henry Perrine, United States Consul at Campeachy, introduced into Florida

a few plants from the vicinity of Merida, Yucatan. In later years stock from the Florida plants was carried to the Bahamas, Trinidad, and many other parts of the world.

In 1893 the Hawaiian Commissioner of Agriculture and Forestry imported about 20,000 sisal plants from Reasoner Bros., Oneka, Florida. The favorable results of the experimental work in Hawaii led to the organization, in 1898, of the Hawaiian Fibre Company. This corporation secured about 300 acres on the coral limestone coastal plain which skirts leeward Oahu, and began planting on a commercial basis. The original investment represented about \$37,000. The land controlled by this company now (1918) comprises about 3000 acres, with a capitalization of \$150,000, and an annual yield of about 500 tons. The company employs about 60 laborers, men and women; at present all are Japanese. The minimum wage is \$1.25 per day (U. S. gold); in addition to this, living quarters, land for gardens, water, insurance, fuel, and medical attendance are furnished by the company. This gratuity represents an expenditure of over \$.25 per day per laborer. These wages correspond with those of the sugar and pineapple plantations for the same classes of labor, and strikingly indicate that Hawaii, contrary to popular opinion upon the mainland, does not possess "cheap labor".

Both varieties of sisal, *elongata* and *Sisalana*, are perennial, with rosettes of 50-75 leaves. These are nearly straight, erect or spreading, 3-6 ft. long, 3-5½ ins. wide, and about ¼ in. thick above the base. The apex terminates in a sharp spine about 1 in. long. The henequen (*elongata*) develops a distinct trunk 3-6 ft. high. Its leaves are 2-2½ ins. thick at the base, and are always armed with conspicuous marginal spines or hooks. It has a life period of 15-25 years.

Sisal (*Sisalana*) has a very short trunk; the leaves are rarely more than 1 in. thick at the base; are pale green but not glaucous and are 4-6 ft. long by 4-5½ ins. wide. They are usually smooth-margined but sometimes bear here and there a few unequal spines. The young Hawaiian sisal plants have foliage with marginal spines, but these spines disappear as the plants grow older. This fact corroborates the theory that *Sisalana* is derived from *elongata* or an equivalent form; the latter probably represents a more primitive condition. The terminal spine of sisal is stout, and purplish-black in color. Sisal produces a stronger, softer, whiter fiber than henequen. Its life period is from 8-10 years, as contrasted with the 15-25 year life of henequen, and this shortness of life constitutes one of the physiological problems of sisal culture. *Sisalana* is raised in the Bahamas, Turks and Caicos Islands, Santo Domingo, Central America, East Africa, Java, India, and the Hawaiian Islands. However, the production of henequen in Yucatan greatly exceeds the combined production of all other localities.

Upon maturity the sisal plant sends up a flowering pole or



scape 20-30 ft. high. The pole is 3-6 ins. in diameter at the base; the outer layer or rind becomes hard and dry; whereas the interior is soft and pithy. Economically the poles constitute a waste product; they have a low fuel value and but few practical uses. The panicle is about 8 ft. long and 4 ft. wide. There are 30-40 horizontal candelabrum-like branches in the panicle; the largest, near the middle, are 2 or more feet long, the upper and lower ones are shorter. At the ends of the branches are borne dense clusters of erect flowers. These are almost invariably sterile; seed capsules are very rare, except when produced artificially by means of careful hand pollination. Normally, in the course of a few days the flowers wither and drop, functionless, and are quickly succeeded by the vegetable bulbils, which will be described later. In its flowering habit the sisal may be compared with the Hawaiian bananas, which produce huge quantities of flowers that never seed; reproduction has become wholly vegetative and asexual.

The root system of the sisal plant is relatively simple. The roots extend outer near the surface, rarely descending below 12-8 ins. When given sufficient room the roots will generally spread out over an area equal to that covered by the mature leaves.

The botanical name of the so-called "malina" is *Frucraea gigantea*, allied to the agaves. It is common in old gardens and along roadsides and waste places. It is now thoroughly naturalized, and is known to the Hawaiians as "Malina" (their rendering of Manila, in reference to its hemp-like qualities). The plant is a gigantic rosette, resembling sisal in aspect, except that the leaves of *Frucraea* are larger, broader, thinner, and much darker green. The fibre, known commercially as *pita*, is long and fine, but inferior to sisal in strength. It is extensively cultivated in Mauritius, and is commercially known as "Mauritius hemp".

Sisal fibre is hard or harsh, 3-5 ft. long, and tending to be somewhat coarse and stiff. It is light yellow or nearly white in color, lighter in shade than henequen, and much paler than Manila. It is heavier than Manila but its working strength is about one-tenth less than that of Manila of the same size and type. Sisal fibre is used most extensively for binder twine. It is also used for lariats and general small cordage of one inch diameter and under sisal is not as well adapted for marine work as the true Manila.

Hawaiian sisal for many years has demonstrated in the open market its superiority over that produced elsewhere. This has been corroborated repeatedly by fibre experts. It has uniformly commanded better prices than the best grades of henequen grown in Yucatan.

The yield of fibre is 3-4% of the weight of the green leaves. The average yield of clean, dry fibre is 500-1,200 lbs. per acre.

One thousand leaves produce about 50 lbs. of clean fibre. (Of the 4% available fibre in the sisal leaves, a certain percentage is wasted in the machine-milling. This waste can be dried, carded, and worked into a material for stuffing mattresses. This sisal mattress-fibre is excellent for the tropics, being light and cool and distinctly sanitary. The short waste fibres also can be used for making a paper much like Manila, and used for wrapping, etc.

The water leaf-pulp, which is very acid, is returned to fields as a fertilizer. This material possesses possibilities as a by-product that have not yet been developed.

Sisal fibre has a world market and shipments go from Hawaii to many ports. San Francisco, New York, and Japan are the chief markets. Practically the only competition is that of Yucatan, which raises 90% of the world crop. Hawaii contributes about one-tenth of one per cent, and does not begin to supply the demands for her sisal. The United States imports annually from 15 to 18 million dollars worth of sisal and henequen fibre, most of which goes into binder twine. The steadily increasing demand for sisal fibre is concomitant with the rapidly extending utilization of mechanical grain binders, using twine, throughout the world. The shipments of sisal from Hawaii to the United States mainland for the past six years, have been as follows:

June 30	Tons.	Value
1916.....	445	\$68,764
1915.....	474	52,608
1914.....	457	59,915
1913.....	325	44,221
1912.....	334	34,499
1911.....	151	15,096

Sisal is characteristic of regions possessing a continuous warm and somewhat dry climate. Contrary to popular opinion, it is not highly xerophytic, but is sensitive to light frosts. The lowest recorded temperature in the sisal-growing districts of Yucatan is 48°; the annual precipitation is 29-39 inches. The altitudinal range is relatively narrow. Most sisal land lies at elevations of not more than 100 ft. above sea level. It is successfully grown, however, up to altitudes of 2500 ft. The main plantings of the Hawaiian Fibre Company lie at about 700 ft.

Sisal is exacting in its requirements with reference to shade and soil water. It will not grow in swampy soil where its roots are immersed in stagnant water; it is intolerant of shade. The best sisal lands are brilliantly illuminated, thoroughly drained plains, with rich soil and fairly abundant rainfall. Although sisal can and does grow successfully on thin, dry, rocky soil, the quality and yield of fiber is markedly improved when the plant

is raised under optimum conditions of rainfall, soil fertility, and cultivation.

The rainfall on the Oahu sisal lands is about 30 inches per annum. No artificial irrigation is undertaken as there is no available water. Despite the popular impression that sisal has very low water requirements, it is unquestionably true that this crop will respond generously to increased water supply. If water could be obtained at low cost the increased yield of fibre would probably more than pay for the expense of irrigation, and the life of the plant lengthened. There seems to be practically no data concerning the response of sisal to irrigation.

Hawaiian sisal is notably free from insect pests and fungus diseases. The plants are uniformly clean and sound, and their life is terminated only by their own physiological boundaries. Occasionally, through carelessness or misfortune, a fire gets started in the dry weeds and brush between the rows. This ruins all of the sisal plants with which it comes in contact. Fires of this kind are counted among the most serious enemies of sisal.

Sisal leaves do not drop off or separate themselves from the parent plant. Normally, upon maturity, they droop groundward and become dry, leathery, and shrivelled. When the whole plant finally dies it remains *in situ* for a number of years, a mass of debris, surrounded by offshoots in various stages of development.

Two wholly distinct sets of structures for vegetative reproduction are produced by the sisal plant,—offshoots and bulbils. The offshoots or suckers (rhizomes) are formed after the first or second year in the field and their production continues until the death of the plant. Bulbils ("pole" or "mast" plants) are formed only upon the pole or scape, and thus come only once in the life-history of the plant, just prior to its death. The offshoots develop from the roots and come up through the soil in the immediate vicinity of the parent plants, although sometimes at a distance of 6-12 feet. There are usually 6-18 offshoots around a mature sisal plant. The aerial portion is 8-24 inches high, and is a miniature rosette, resembling the parent plant. It obtains food not only from its own roots, but also from the runner from the parent plant. These suckers correspond in structure and function to the suckers that occur on such other tropical plants as the taro, date palm, pineapple plant, banana, etc.

The bulbils are formed on the branches of the pole, after the flowers have fallen. One to four thousand bulbils are borne upon a single pole. The bulbils are 1-6 inches long, and comprise several fleshy leaves upon a short stem. They fall to the ground and root and may be gathered for propagation. Bulbils are not as good as offshoots, however, as they require 1-2 years in a nursery before they are suitable for planting out in the fields. When about 1 ft. high the nursery plants are dug, all the roots and about half of the leaves are cut off, and the plants



are allowed to dry for 1-3 months. Plants thus treated are better for transplanting and respond more quickly in the field.

After a year's growth the offshoots are suitable for propagation. It is customary to dry them for several months before planting, just as in the case of the bulbils; this drying appears to aid the plant in making a good start after being set out. In general, offshoots are universally used for propagation, except for starting plantations at long distances, where bulbils are sometimes used, as they are smaller and more easily transported.

The young plants are usually set out at the beginning of the rainy season, in order that they may receive its full benefits. In the Hawaiian Islands the rains begin in November and continue until March or April. The difference between summer and winter is slight, however, both as to rainfall and as to temperature. From 500 to 1000 plants are set to the acre, the number varying with topography and soil conditions. The planting distances are 6x6, 9x10, 9x12 feet, etc. The Hawaiian Fibre Company uses 9x6 feet as its standard for planting. The land is kept free from weeds and brush by occasional cultivations, averaging once every 3-6 months.

The Hawaiian sisal leaves are not cut until the plants are four years old. After the first cutting the plants live about five years; then the flowering poles are thrown up and the life of the plant soon terminates. 10-20 leaves are taken off each plant at each harvesting. The leaves are cut when 4-5 ft. long and when the lower ones are nearly horizontal. Only the lower leaves are taken. In the Bahamas the first crop is cut the third or fourth year after the plants are set and annual crops are secured thereafter for 6-12 years. In Yucatan the first crop is not cut until the sixth or seventh year, and after that a crop is gathered every eight months for 15-25 years. The leaves are tied into bundles of 50 each, for transporting to the mill. At the time of poling the average sisal plant has produced about 135 leaves, of which 100 are mature or nearly so, and 35 leaves which will mature within one year, providing the pole is cut off just at the base of the uppermost leaves.

Sisal fibre is removed from the leaf in two ways, by hand and by machinery. As is true of other fibers, however, the hand-cleaned sisal fibre is distinctly superior for certain purposes to the machine-cleaned product. In certain sections of Yucatan and Mexico the natives clean the fibre by hand; one man can clean 6-9 lbs. per day. This fibre is used exclusively for the manufacture of fine hammocks, which sell for their weight in silver.

The various types of scutching or decorticating machines closely resemble one another in principle. The fresh green leaves are fed sidewise into the machine at the rate of 30,000-40,000 leaves per day. About 20 seconds are required in which to clean a single leaf. The green juicy pulp or parenchymous tissue, which com-



prises the bulk of the interior of the leaf, is crushed, beaten, and scraped away by blunt knives fastened to 2 rapidly revolving drums.

The sisal juice contains very strong acids that are destructive to all sorts of common materials,—iron, cement, leather, wood, etc.,—with the exception of bronze. All working parts of the sisal machine that come in contact with the sisal juice are therefore constructed of bronze. In some machines streams of water play upon the fiber as the latter passes through the scutching wheels.

The fiber is taken directly from the machine to the drying yard where it is spread out in the hot sunshine to dry and bleach. It is laid flat on the smooth floor of crushed coral and turned once. This process requires about 6 hours. The dry fiber is well brushed, so that all the fibers are parallel with one another. The short, kinked, and waste fiber is sorted out. Finally the fiber is baled into bales weighing about 700 lbs. The baling box is 4'6"x2'6"x2'6" and is operated by screw or hydraulic pressure. The bales require no covering, and are tied with ropes made of the fiber. They are conveyed to the wharf at Honolulu by the railroad.

During the past two years experiments have been carried on in Hawaii to produce a hybrid sisal derived from the two parents *clongata* and *sisalana*. It is hoped that this hybrid will produce the superior qualities of fiber from the *sisalana* and partake of the much desired quality of long life of the henequen. Experimentation of this kind is not known by the authors to have been attempted in any other part of the world.

There are also under way, in Hawaii, chemical investigations of the waste product. These studies indicate that valuable properties are undoubtedly latent in the sisal wastes.

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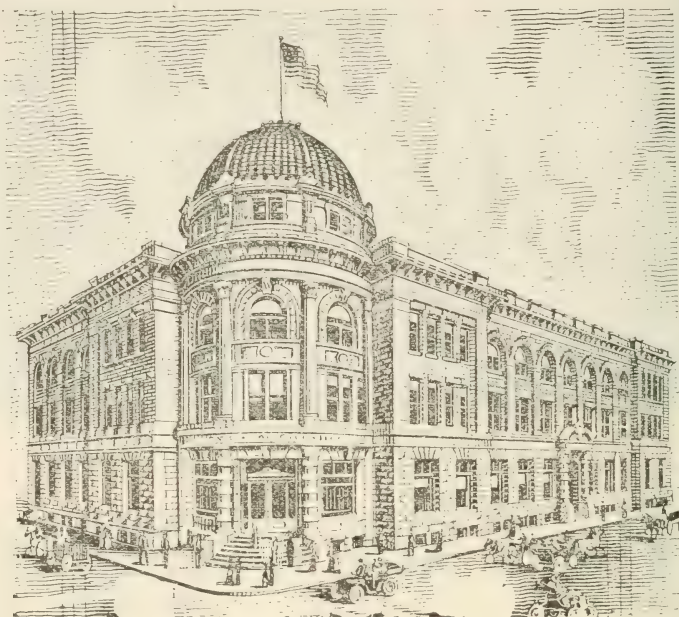
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**3**  
**BULLS**

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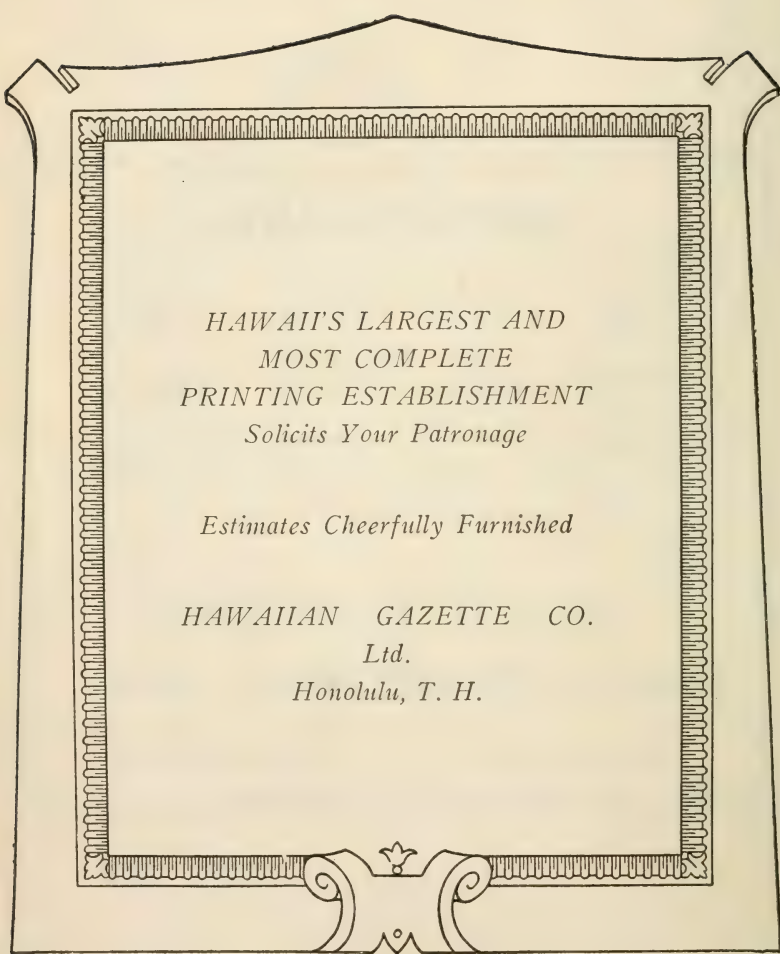
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

MARCH, 1918

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# Board of Agriculture and Forestry

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The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

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Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

HONOLULU, MARCH, 1918.

NO. 3

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The planting out of introduced species of the *Ficus* and other trees recommended by Consulting Botanist J. F. Rock on the watershed in Manoa Valley is in the nature of an experiment to determine their value as water conservers.

The Division of Forestry continues to make progress in the raising and distribution of tree seedlings, the planting of open places in the forest reserves and in the protection of the native reserved forest by fence building and cattle hunting, as shown by the current report for January.

All who are interested in agriculture and kindred subjects are invited to come to the Government Nursery on King Street, Honolulu, where there is an accumulation of duplicate volumes, pamphlets, and bulletins on such subjects which will be given to those who can make good use of them.

The trade in Maui beans during February was very brisk, according to the report of the Acting Superintendent of the Marketing Division. The service of this Division to the small farmer and producer is attested by the fact that this Division sold almost \$20,000 worth of produce for them during the month, and has no trouble in disposing of all island produce received in good condition at fair prices. It would be to the financial advantage of the grower to give greater attention to the grading and packing of his products.

Tropical Life (London), one of the leading magazines of tropical agriculture in the world, in its February number, under its regular heading, "Our Friend," contains a portrait of the editor of the Hawaiian Forester and Agriculturist, with his "jubilee" biography from the Christmas number of the *Paradise of the Pacific*. This friendly distinction in the British periodical originated from the review of a book written by Mr. Harold Hamel Smith, editor of *Tropical Life*, on the future of the sugar industry of the empire, which the editor of the *Forester* contributed to the *Honolulu Star-Bulletin* and which was reprinted in *Tropical Life*, being given the leading position in that magazine.



Mount Hermon School, situated in the town of that name in the beautiful Connecticut River valley, has developed a herd of registered Holsteins within a comparatively short time, which is claimed to be one of the most striking illustrations of systematic breeding on record. An article sent to the Forester upon the institution and its work, which is too long for our space, says the school was founded by the late D. L. Moody, whose purpose was to give boys unusual opportunities for study. The courses of study fit the students for entrance into the large universities. It is stated that the development of the herd was begun in 1904 with the purchase of a few registered cows and a proved sire. From that small nucleus the herd has increased to 160 registered animals that are now known far and near for their uniformity, large production and heavy winning in the show ring.

The recent heavy rains and consequent torrential floods which have resulted in the washing out of gullies, destruction of bridges and roads, and the causing of considerable erosive damage to fields, with the consequent loss in fertility by washing the finest soil down to the sea, should bring to the attention of every agriculturist in the Territory the importance of preventing or at least lessening such damage in the future by giving greater protection to the forest back up on the mountains where such destructive floods start. The total excessive runoff can not be completely controlled but it can be greatly modified by keeping a proper protective cover of trees and other vegetation at the headwaters of streams and on all watersheds. The Division of Forestry is doing what it can within its means to give the native forests under its control this necessary protection and building up, and it behooves the controller of every private forest to do likewise. A well protected forest not only prevents excessive runoff but protects the soil and stores the water. It is well known that streams coming from an undisturbed, virgin forest are seldom muddy and are subject to comparatively small variations in flow. It is up to the land owner to decide not whether he wants all of the precipitation to run off his land at one time or to store it up in the forest for use in the dry season by giving this forest proper protection.

## Division of Forestry

Honolulu, April 9, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN: I respectfully submit the following routine report of the Division of Forestry for the month of January, 1918:

## TREE PLANTING.

Replies were received from 36 tree planters in the Territory, out of a possible total of 55, showing by species the number of trees set out during 1917 and the purpose of planting. It is planned to obtain replies from the remaining tree planters so as to make complete the statistics for the year.

On government land in Manoa Valley within the Honolulu Watershed forest reserve, in addition to the regular planting of koa trees on well-drained soil and the ridges, a start on a small scale has been made in the planting of certain introduced species of trees recommended by our consulting botanist for wet forest regions. These trees have been planted in one of the small valleys, which is easy of access and which can be kept under close observation, and include species of ficus and the African tulip tree, *Spathodea campanulata*. A quantity of seedlings of the indigenous *Papala kepau*, *Pisonia inermis*, raised in the nursery from seed collected by Ranger Lindsay on Maui, has also been planted in Manoa on the dryer ridges.

On Kauai, Ranger Lovell planted during the month 150 silk oak trees on open land along the makai boundary of the Kealia reserve in the general plan for protecting the native forest further mauka.

Attention is called to the fact that the Government Nursery distributed during January at cost a total of over 155,000 young trees for general planting throughout the Territory, thus aiding on a large scale the reforestation of open land in the islands for various purposes.

## FOREST RESERVE MATTERS.

The manager of the Kukaiau Ranch reports that the coöperative fence for the protection of government lands in the Hilo forest reserve near Piha, Hawaii, is nearing completion and that progress is being made, in spite of the heavy rains, in ridding the forests of this region of wild stock, one large wild bull and two wild cows having been killed during the month.

A form of permit for camping on unleased open government land within the Na Pali-Kona forest reserve, Kauai, was perfected during the month, preparatory to its adoption by the Board.

New annual permits were issued early in the month to the old Hawaiian squatters in Lower Makiki Valley within the Honolulu Watershed forest reserve.

## FOREST PROTECTION AND IMPROVEMENT.

The encroachment of dairy cattle in the native forest on the Pacific Heights ridge was investigated with Ranger Hipple and it was found that the animals were damaging the native vines

and undergrowth on private land some distance makai of the forest reserve. This undesirable condition was explained to the controller of the land, who stated that he would at once require the dairymen to mend the fence so as to prevent further trespass.

Under the informal coöperative agreement with the Land Office for furnishing technical assistance in forest matters on unreserved government lands, a plan for the improvement of the algaroba forests in the region of Lualualei, Oahu, by way of thinnings to increase the yield of honey, beans and wood was prepared in the form of instructions to the Sandwich Islands Honey Company who hold licenses from the Land Office to operate on the public lands in that region.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

---

## FORESTRY NURSERYMAN'S REPORT.

Honolulu, February 28, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR: I herewith submit a report of the principal work done during the month of February:

### NURSERY.

#### *Distribution of Plants.*

	Seed Boxes	Transplant Boxes	Pot Grown	Total
Sold .....	....	...	70	70
Gratis .....	1,000	600	868	2,468
	<hr/> 1,000	<hr/> 600	<hr/> 938	<hr/> 2,538

### COLLECTIONS.

#### *Government Realizations.*

Collections on account plants sold.....	\$ 1.60
Rent Building Nursery Grounds, December.....	35.00
Total .....	<hr/> \$36.60

*Plantation Companies and Other Corporations.*

Orders have been received for 25,000 trees to be delivered in near future. We intend shipping the last of our orders for the season during the months of March and April.

*Makiki Station.*

The work at this station has been principally routine. We have been doing some sawmill work during rainy weather. So far we have cut a number of fence posts, also laths and small wood for seed and transplant boxes.

*Honolulu Watershed Planting.*

During the month 450 koa trees were planted on bare ground at the top of Makiki Valley. Other work consisted of hoeing and clearing away grass and vines from the young trees.

*Manoa Valley Planting.*

During the month 1313 trees were planted consisting of the following:

<i>Ficus religiosa</i> .....	300
“ <i>sutripblinervis</i> .....	12
<i>Spathodea Campanulata</i> .....	765
<i>Albizzia Moluccana</i> .....	236
Total .....	1,313

*Advice and Assistance.*

On February 7, the writer, along with Mr. L. St. John Gilbert, visited the algaroba forest at Nanakuli near Waianae for the purpose of marking the trees to be left as standards according to agreement drawn up by the Superintendent of Forestry.

Other visits and advice given have been as follows:

Visits made to places in and around city, 8; advice given by telephone, 10; advice given by letter, 6; advice given at nursery, 12.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.



# Division of Entomology

Honolulu, February 28, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month of February the insectary handled 24,100 pupae of the melon fly, from which there were bred 677 females and 537 males, *Opius fletcheri*.

The distribution of parasites was as follows:

## *Opius Fletcheri.*

	Females	Males
Honolulu:		
Moanalua .....	158	130
Makiki .....	144	155
Kauai: Kealia.....	245	200

## *Diachasma fullawayi.*

Honolulu:		
Manoa .....	140	50
Kalihi .....	45	45

## *Opius humilis.*

Honolulu: Manoa.....	20	5
----------------------	----	---

## *Diachasma tryoni.*

Honolulu:		
Manoa .....	120	40
Kalihi .....	125	45

## *Paranagrus* (Corn Leaf Hopper Parasite)

Honolulu: Makiki Nursery.....	13,100
Maui: Haiku .....	2,700
Hawaii: Kohala .....	200
Molokai: Pukoo.....	1,350

Very respectfully,

DAVID T. FULLAWAY,  
Entomologist.

# Division of Plant Inspection

---

Honolulu, February 28, 1918.  
Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of February, 1918, as follows:

During the month of February there arrived at the port of Honolulu 40 vessels, of which 18 carried vegetable matter subject to inspection, which was disposed of as follows:

	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	604	17,415
Fumigated .....	14	145
Burned .....	41	42
Returned .....	3	3
Total inspected .....	662	17,605

Of these shipments there were 17,338 packages of freight, 179 packages of mail matter and 88 packages of baggage belonging to passengers and immigrants.

## RICE AND BEAN SHIPMENTS.

During the month 28,997 bags of rice and 878 bags of beans arrived from Japan and Oriental ports and after careful inspection were found free from pests.

## PESTS INTERCEPTED.

Approximately 5017 pieces of baggage belonging to passengers and immigrants from foreign countries were examined and from the same 32 lots of fruit and 6 lots of vegetables were seized and destroyed by burning.

On February 5, a few ants were discovered in a case of orchids from Manila. The plants were fumigated and the packing burned.

On the same date a small package of orchids in a passenger's baggage from Yokohama was fumigated as a precaution.

On the same steamer a member of the ship's crew attempted to land a maple tree which was returned on board.

On February 5, a package of medicinal roots from Manila in the mail showed evidence of borers and was fumigated before delivery, also a package of tree seeds and plants in the mail from Yokohama was returned to the sender as unmailable.

On February 10, a number of workers of a common ant were found in the packing of a case of fruit trees from California. The trees were fumigated and the packing burned.

On February 25, workers of the Argentine ant were discovered in a shipment of trees from Oakland, California. The plants were fumigated, and the soil and packing burned before delivery.

On February 28, a basket of lichee trees from China brought by a sailor was returned to the ship. On one leaf we found a bag worm, a very serious pest known to do great damage to foliage in the Orient.

#### HILO INSPECTION.

Brother M. Newell reports the arrival of four steamers, two of which carried vegetable matter, consisting of 88 lots and 1623 parcels of fruit and vegetables. All were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Will J. Cooper reports the arrival of six steamers, two of which carried vegetable matter, consisting of 11 lots and 451 parcels of fruit and vegetables. All were found to be free from pests.

#### INTER-ISLAND INSPECTION.

Fifty-two steamers plying between Honolulu and other island ports were attended, and the following shipments were passed as free from pests:

Taro .....	650	bags
Vegetables .....	211	packages
Plants .....	65	"
Fruit .....	22	"
Rejected .....	2	"
<hr/>		
Total shipments .....	950	packages

Two packages of plants were refused shipment on account of infestation and undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

## Division of Animal Industry

Honolulu, February 28, 1918.

DOCTOR A. NÖRGAARD,

Chief, Division of Animal Industry, Bureau of Animal Industry, Honolulu.

SIR: I beg to submit the following report for the month of February, 1918:

### *Tuberculosis Control.*

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
Desidero Telles .....	3	2	1
Thomas Lee.....	5	4	1
A. N. Campbell.....	1	1	0

A total of 9 head were tested, out of which number 7 were passed and 2 condemned and branded.

Besides the above, 7 head of condemned cattle were inspected at the local abattoirs, of which 6 were passed for beef and 1 condemned entirely.

### *Septicemia Hemorrhagica or Swine Plague.*

A small outbreak of swine plague occurred at Mr. Bortfeld's piggery and a total of 9 pigs were injected with Septicemia Hemorrhagica bacterin with excellent results.

### *Contagious Epithelioma or Sorehead.*

Small outbreaks of this disease have occurred during the past month among turkeys and chickens, and about 1,000 c.c. of vaccine have been distributed among the various poultry raisers. Uniformly successful results have been reported.

### *Importation of Live Stock.*

S. S. Lurline, San Francisco: 1 dog, 14 crates poultry.  
 S. S. Columbia, San Francisco: 1 cat.  
 S. S. Governor, San Francisco: 1 dog.  
 S. S. Hyades, San Francisco: 2 Shetland ponies.  
 S. S. Makura, Sydney: 1 dog.  
 S. S. President, San Francisco: 1 dog, 1 box white rats, 7 crates pigeons.  
 S. S. Shinyo Maru, Orient: 1 dog.

Respectfully submitted,

LEONARD N. CASE,  
 Asst. Territorial Veterinarian.



## Marketing Division

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Honolulu, March 1st, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following report of the Territorial Marketing Division, for the month of February, 1918.

During the month the Division handled large quantities of Maui beans and a large number of consignments of other produce. The sales of produce for the month amounted to \$19,948.25, the largest amount for any one month to date.

Practically all of the Maui red beans have been sold but there is still a quantity of small white beans on hand which I think the Army will be able to use as they are the same variety as issued by the commissary.

All produce received during the month was readily disposed of at good prices, and there continues to be a big demand for all island produce received in good condition. Farmers should pay more attention to grading and packing their produce. Instruction to producers along these lines should be given more time by the county agents on the different islands.

The Division has a quantity of beans on hand which will be difficult to dispose of until they are graded. It will cost considerably more to clean and grade these beans here than on the farms where the poorer grades could be used for feeding stock.

Very little beef has been received during the month. The Raymond Ranch, which has been our largest consignor of beef in the past, is not shipping to us, having made a contract with the Mutual Produce Company for their entire output of beef. This makes it difficult for us to obtain enough meat to supply our customers. The Raymond Ranch was a great help, as it enabled the Division to assure customers of a regular supply of beef, and at the same time helped to dispose of the smaller and more irregular shipments.

The books are in better condition now than they have been for some time. Mr. Ouderkirk, with the assistance of the Auditing Company of Hawaii, has been able to balance the books. We have opened a consignors' ledger which will greatly assist in eliminating many of the errors made in the past.

The financial statement and trial balance for February is enclosed herewith.

Respectfully,

O. B. LIGHTFOOT,  
Acting Superintendent.

# The Hawaiian Kamani

✓ (*Calophyllum inophyllum* L.)

By VAUGHAN MACCAUGHEY, College of Hawaii, Honolulu.

One of the most characteristic littoral trees in the Hawaiian archipelago is the *kamani*, *Calophyllum inophyllum* L. It is distinctive of many Polynesian beaches, and of the picturesque native settlements that formerly clustered along the lovely strands of Hawaii. The *kamani tree* was valued by the early Hawaiians for its ample and refreshing shade, its attractive flowers, its medicinal resin, its copious fragrant oil, and its beautiful-grained wood. It is today reckoned among the important cabinet woods of Hawaii. During a residence of ten years in the Islands, the author has had opportunity to study this interesting tree of Polynesia and the Old World tropics. The present paper, to the author's knowledge, is the first extended and modern account in the literature.

The *kamani* family, Guttiferae, is so called from the Latin "drop-bearing," in allusion to the resinous exudation which characterizes many of its members. It is closely related to the Hypericaceae, with which it is united by many botanists. It comprises 35 genera and about 370 species, widely distributed throughout the tropics of both hemispheres. *Garcinia*, with 150 species (Old World), and *Clusia*, with 80 species (American), are the largest genera. Many species are stately tropical trees, with beautiful foliage and useful timber. Most species of Guttiferae yield a yellow or greenish resinous juice when cut. Commercial gamboge, an intensely yellow resinous pigment, is derived from *Garcinia morella*. Various clusias have juices which are purgative, and in some cases are used as varnish. The mammee apple (*Mammea americana*) is a noteworthy tropical fruit that is plentiful in Hawaii. The mangosteen (*Garcinia Mangostana*), of the East Indies, is one of the very finest tropical fruits.<sup>1</sup> There are no indigenous Guttiferae in the Hawaiian Islands. The *kamani* was introduced in early times by the primitive Hawaiians, and is now thoroughly naturalized.

The genus *Calophyllum* comprises 55-60 species, all of the Old World except four tropical American species. The Greek name, "beautiful-leaved," refers to the rich, dark-green, shining foliage, which is indeed handsome. The genus is closely related to *Garcinia*, which, however, has only 4-8 petals. The *calophyllums* are mostly large timber trees, rich in balsamic resins, with oily seeds, and shining foliage.

<sup>1</sup> See MacCaughey, Vaughan: Mangosteen in Hawaii, Hawaiian Forester, 14:125-6, May, 1917.

Forest trees of the Hawaiian Islands. Bull. Torrey Bot. Club, 44:145-57, March, 1917.

The only species in the Hawaiian Islands, and in many other parts of Polynesia, is *C. inophyllum*, the Hawaiian *kamani*. In Tahiti it is called *tamanu*; in Samoa, *tefau*; in Fiji, *dilo*; in the Philippine Islands, *palo maria*; in the East Indies, *pinagah* or "Borneo mahogany"; in Ceylon, *domba*; in India, *undi* or "Alexandrian laurel." In Malaya the name *betan* or *bentangar* is applied indiscriminately to about 20 species of *calophyllum*. In India the name *doon* is given to various species of *calophyllum*, which are used for masts and spars.

The *kamani* ranges throughout Asia and Polynesia, from East Africa, to India, Malaya, Polynesia and Hawaii. The Hawaiian Islands represent the northernmost Pacific boundary of the *kamani*'s range, and its presence in these Islands is undoubtedly due to human agency.<sup>2</sup> In the Hawaiian Islands it occurs here and there along the shores and lowlands of all the large islands of the group. It is absent, however, from the little isles and atolls that are scattered along an axis of some 1500 miles to the westward of the main group, and is also absent from the lesser isles of the main group itself. These absences are not due primarily to unfavorable soil or climatic conditions, for the *kamani* thrives on dry, sandy beaches where little else will grow. The *kamani* seeds are buoyant and admirably adapted for dissemination by ocean currents. The absence of self-planted individuals or groves on the smaller islands above mentioned indicates clearly, as do many other biological evidences, that the Hawaiian currents are practically non-effective as seed carriers. The *kamani* in the Hawaiian Islands is found only where it has been planted (by the Hawaiians) or in the immediate vicinity of such settlements.

It grows along both the windward and leeward beaches, and on lowlands up to an elevation of 1000 feet. Although it is usually thought of as a littoral tree, it is not strictly so, and reaches noble dimensions in the lower valleys and slopes. It will grow on very dry coasts, but strictly xerophytic, although its foliage shows strong xerophytic characteristics. It grows best under conditions of moderate rainfall (20-60 inches), relatively high temperatures, and abundant insolation. It is not tolerant of shade, even in its juvenile stages, and its foliage is well adapted to withstand the brilliant illumination that is so characteristic of the Hawaiian strand. The *kamani* was formerly much more abundant along Hawaiian coasts than at present; its decimation has been due to a variety of influences—the disappearance of the native Hawaiian, the ravages of cattle and goats, the felling of the trees for timber, without replanting, and the constant encroachments of civilization.<sup>3</sup> A famous grove of *kamani* still

<sup>2</sup> See MacCaughey, Vaughan: Food Plants of the Ancient Hawaiians, Scientific Monthly, 4:75-80, Jan., 1917.

<sup>3</sup> See MacCaughey, Vaughan: Survey of the Hawaiian Land Flora, Botanical Gazette, 64:89-114, Aug., 1917.

Vegetation of Hawaiian Lava Flows. Botanical Gazette, 64:386-420, Nov., 1917.

exists at the mouth of Halawa valley, Molokai, and the tree is still abundant along the Puna coast of Hawaii. It is plentiful in the Honolulu region, and occurs scatteringly along other coasts.

The tree is generally low and broad, with a short, thick, stocky trunk and a globular of flattened crown. The usual height of the *kamani* is 25-35 feet; occasionally trees rise to 40-60 feet. The spread of the crown is usually greater than its height, approximating 30-40 feet; very old trees may have a spread considerably wider than this. The trunk is 18-36 inches in diameter, and usually only 4-8 feet clear to the first branches. The *kamani* naturally branches close to the ground. Old trees, if unpruned, have large horizontal branches, 18 inches in diameter and 15-20 feet long, sweeping close to the ground. The trunk of very old trees may be 4 feet or more in diameter. Not infrequently there are two or three trunks arising from a common base.

The trunk of old trees is often spreading or buttressed at the base, with numerous large radiating, thick-barked roots, 18 inches or more in diameter. These roots coalesce about the base of the trunk, forming a woody network or platform, 10 feet or more in diameter. In the sandy coastal soil the roots spread horizontally near the surface for distances of 30 feet or more from the trunk. Like many other littoral trees, the *kamani* is usually wind-shaped. The crown is often conspicuously assymmetrical, with most of its growth to the leeward side of the trunk. The *kamani* is not self-pruning, and in old trees there is often a considerable accumulation of dead branches and twigs.

The old bark is rough, scaly, and deeply fissured; its *thickness* is 1-1.5 inches. The fissures are broad and coalescing, and break the bark into coarse, woody, flaky scales, 3-4 inches wide and 8-18 inches long. The scales are gray or dark chocolate brown, and on the windward side of the trunk are usually well covered with lichens and epiphytic algae. Seemann states that in Fiji the trunk is usually thickly covered with orchids and ferns. The bark of the fissures is light ashy-brown. The ground around the base of an old tree is generally littered with a considerable accumulation of bark scales. The bark of the young twigs is ashy or blackish-brown.

The wood is of medium hardness, closely but coarse-grained, and of a reddish-brown color.<sup>4</sup> The pigmentation is often more or less irregularly and broadly banded, and gives to the timber a handsome wavy pattern. The sapwood is much lighter in color than the heartwood. *Kamani* wood is very strong and durable. Its mechanical characters are as follows:

Specific gravity = .579-.647.

Weight per cubic foot = 63-85 lbs.

<sup>4</sup> See MacCaughey, Vaughan: Economic Woods of Hawaii, Forestry Quarterly, 14:696-716, Dec., 1916.

— Forests of Hawaiian Islands, Plant World, 20:162-66, June, 1916.



Coefficient of elasticity = 755 tons per square inch.

Direct cohesion in pounds per square inch = 10,000-14,700.

Cohesion compared with oak as 1 = 1.3-1.9.

In India, where the tree is common, the wood is used for cabinet work, machinery, railway ties, and spars. In Polynesia and the Hawaiian Islands it was employed chiefly in the making of the beautiful wooden bowls or calabashes, *umeke*. These were hand-made, with stone tools, and involved great skill and long periods of labor for their completion. The art is today extinct in Hawaii. A genuine hand-made Hawaiian *umeke* of *kamani* wood has a sales-value of anywhere from \$25 to \$300, depending upon its size and condition.

The foliage-bearing twigs are .4-.6 inch in diameter, and 12-24 inches long, with smooth green waxy bark, which turns to brownish. The lenticels are microscopic and practically invisible. On most of the twigs the leaves are terminal, and the basal part of the twig is bare; the terminal cluster comprises 10-20 leaves. Rapidly-growing new shoots, however, may be clad with leaves throughout their length.

The *kamani* leaves persist for several years (2-4 years). The bare portion of the twig is conspicuously marked by the petiole scars. These are oblate, .25 inch in diameter, corky, with a central crescent of fibro-vascular bundle scars. There are no stipular scars or stipules. The lateral buds and flower cluster scars are small and inconspicuous. The terminal bud is .25 inch long, sharply pointed, conical, chocolate-brown, and consisting of several pairs of minute conduplicate leaves.

The leaves are opposite and stand nearly at right angles to the twig. They are 4-8 inches long and 3-4 inches broad. The petiole is about 1 inch long, round or somewhat flattened, green or yellowish green, and tough. Both at its base and at its junction with the blade it possesses well-defined motile or growth-areas (*pulvini*) for the orientation of the blade with reference to the light.

The blade is glabrous, smooth and shining on both faces, thick and coriaceous, entire, broadly oblong or ovate, and with rounded or emarginate apex, and rounded base. Its color is rich dark green, often turning to yellow upon senility. The midrib and marginal vein are bright yellow-green, contrasting with the dark glossy green of the blade. The blade is finely and closely-veined at right angles to the midrib. In recent years and in the vicinity of Honolulu the *kamani* foliage is often more or less infested with mealy-bugs and various fungi. The latter produce discolored brown dead areas in the blade. In general, however, the *kamani* foliage is remarkably clean and vigorous. The Hawaiians used the leaves medicinally, tearing them up in small pieces, soaking the fragments in water over night, and then using the liquid for washing inflamed eyes.

The flowers and fruit are in axillary clusters among the terminal leaves. Flowers and fruit are produced almost continu-

ously throughout the year. The flowers are polygamous, racemose; the racemes are 2-8 inches long. The pedicels are 1-1.5 inches long, subtended by small bracts which are early deciduous. The pedicels, bracts, and other parts of the inflorescence are waxy white. The flowers are .75 inch in diameter and pure creamy white, fragrant. The sepals and petals are not readily distinguishable from each other; the inner sepals are petal-like. There are 4 sepals, 4-5 lines long; the petals are 4, rarely 6-8, oblong, 7-8 lines long. The flowers open one at a time. The stamens are many, free or scarcely united at the base, filiform, with ovate or elongate anthers; the pollen is bright yellow. The pistil is 2-3 lines long; ovary 1-loculed, with a single erect ovule; style long, filiform; stigma, peltate. The ovary is pink or red. The general color effect of the flower is creamy-white, with spots of yellow and pink. There is an abundance of nectar. The flowers are attractive to bees and other insects, which are present in great numbers in the crown.

The fruit is a globose or ovoid drupe, with thin sarcocarp and crustaceous seed-coats. It is about 1 inch in diameter, smooth, almost fleshy, and yellow when mature. The embryo is thick, with minute cotyledons. The dry fruit contains a large amount of buoyant tissue, and the seed-coats are impervious. The seeds are carried by the currents, and are often cast up on the beaches in great quantities. The seeds contain the well-known *domba* oil, which is used extensively in India and the East Indies for lighting purposes. This oil enjoys a great reputation among the natives of Polynesia and Hawaii, as a cure for rheumatism, pains in the joints, and bruises. In tropical Asia it is also known as *pinnay*, *pun*, *cashumpa*, or *woondel*. The oil is yellow green to deep green, fragrant, and non-volatile; it is very copious, and constitutes 30-60% of the weight of the fresh seeds. It hardens when cooled below 50° F. The Samoans use the oil as a remedy for catarrhal affections of the eye. In Micronesia it is used for skin diseases. The Fijians use it for greasing their bodies and polishing their weapons.

The oil should not be confused with the resin, *Tacamahac orientale*, which is obtained by incising the younger parts of the trunk. This resin is pale yellow, inclined to green, slightly translucent, soft and adhesive, of an agreeable odor, and an aromatic bitter taste. Its medicinal properties are analogous to those of turpentine; it was formerly used internally, but is now used only in ointments and plasters. Both the oil and the resin were used medicinally by the primitive Hawaiians; neither is now collected commercially in the Islands.

Among the white people in the Hawaiian Islands the *kamani* is coming to be recognized as a valuable and beautiful strand tree. Trees now standing are receiving much more care and protection than formerly, and many new plantings are being made. The *kamani* is a noteworthy horticultural asset, and will be used more and more extensively in Hawaii's landscape gardening, as well as a source of handsome timber.

## A NEW FRUIT FLY BULLETIN.

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"The Mediterranean Fruit Fly in Hawaii," by E. A. Back and C. E. Pemberton, Bulletin 536 of the U. S. Department of Agriculture, is a comprehensive account of the fly, based largely on several years of investigation in Hawaii, in the interest of mainland horticulture. Everyone interested in any way in the fly should have a copy of this bulletin as a work of reference. It describes the fly, gives its origin and distribution, its mode of development, habits, etc., tells how it was introduced into Hawaii and how it spread, details its destructiveness to horticultural products, and treats fully the different means of control.

Interest is likely to be keen in regard to an insect of such great economic importance. The thoroughness of the inquiry is therefore most gratifying. Local readers will be particularly interested in the long list of fruits affected. While most of the soft-pulped fruits are named, it is indicated that a preference is shown for some while others are often nearly or entirely neglected. Some, like the citrus fruits, show curious differences in susceptibility to infestation. These facts, while interesting in themselves, also have a bearing on the question of the control of the fly by natural enemies. This topic will probably have paramount interest to residents of Hawaii, since considerable public money has been spent in experimenting with natural enemies, which had to be sought in far distant lands and brought hither over thousands of miles of ocean. The question of the effectiveness of these parasitic insects as a check to the multiplication and destructiveness of the fly is treated very fairly. While maintaining that the accomplishment in this important undertaking has fallen short of the ideal, it is admitted that it has brought about a vast improvement in a situation which artificial methods could not affect.—D. T. F.

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## BEARS DAMAGE DOUGLAS FIR POLES.

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An unusual form of damage to young growth was noticed in the upper Wind River Valley, in southern Washington, during the summer of 1917. The bark was torn from the trunks of saplings up to a height, in some cases, of twenty to twenty-five feet. Saplings from four to eight inches d.b.h. were most generally attacked, usually on the uphill side, and about a square foot or so of the bark torn into fragments. In some cases as many as a third to a half of the poles on a ten-acre area showed either old or fresh signs of this injury. The importance of the injury seems to be greatest as a possible source of infection by fungi. Douglas fir appeared to be the only species attacked.

Claw and tooth marks left on the fresh wood surface, and claw marks in the remaining bark, were the evidence that the work was done by bears instead of porcupines, to which similar dam-

age in other regions is usually due. It is asserted by old hunters and residents of the mountains that bears tear off the fresh bark and eat it in the spring during their breeding season. The damage has been observed in several other locations in the same State.

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**BY AUTHORITY.**

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NOTICE IS HEREBY GIVEN that, as provided by law, a public hearing will be held by the Governor of the Territory and the Board of Commissioners of Agriculture and Forestry on Thursday, the 4th day of April, 1918, at 9:30 o'clock a. m., in the office of the Board of Commissioners of Agriculture and Forestry, King Street, Honolulu (Government Nursery), to consider the withdrawal from the Forest Reserve of the entire Island of Kahoolawe, County of Maui, now known as the "Kahoolawe Forest Reserve."

At the said time and place all persons who so desire will be given full opportunity to be heard upon the subject matter of this notice and to present evidence and arguments in person, by proxy, or letter, either for or against the withdrawal of the aforesaid Island from the Forest Reserve.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

The Capitol, Honolulu, March 20, 1918.



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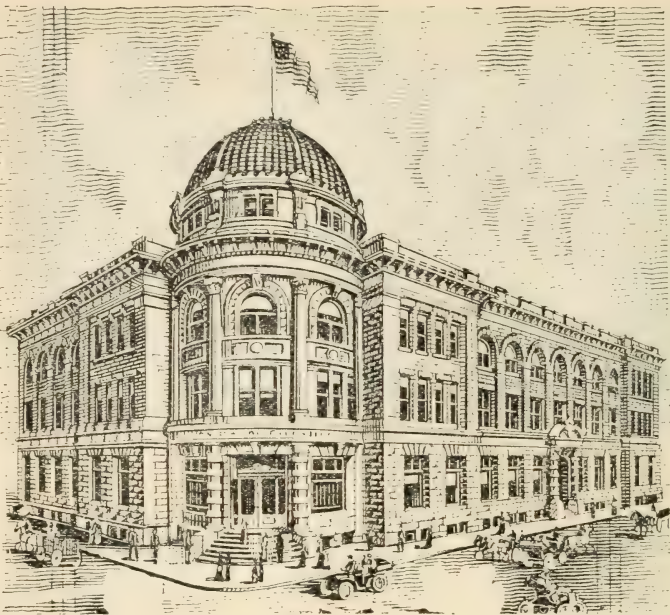
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

APRIL, 1918

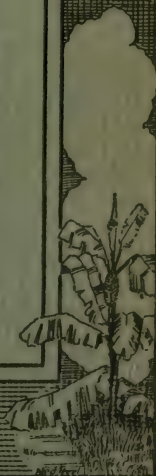
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No. 4



# Alexander & Baldwin,

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# The Hawaiian Forester and Agriculturist

A Monthly Magazine of Forestry,  
Entomology, Animal Industry  
and Agriculture.

Issued under the direction of the Board  
of Commissioners of Agriculture  
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# Board of Agriculture and Forestry

## DIVISION OF FORESTRY.

### FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haugh, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

## PUBLICATIONS FOR DISTRIBUTION.

The Board of Commissioners issues for general distribution to persons in the Territory, annual reports, bulletins, circulars, copies of its rules and regulations, and other occasional papers, which may be had, free, upon application.

A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

HONOLULU, APRIL, 1918.

NO. 4

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The plan of the exhibits which the several Divisions of the Board will present at the coming first Territorial Fair, June 10 to 15, which will show their chief lines of activity, is printed elsewhere in this issue.

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Those who desire to start small commercial plantations of the true mahogany, described in this issue, for future returns of a highly-prized cabinet wood, may secure seedlings from the Government Nursery, provided sufficient advance notice is given.

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It is interesting to note in the current report of the Acting Superintendent of the Marketing Division that, with favorable weather, an exceptionally large crop of corn is anticipated and that a large part of this will be ground into corn meal for local consumption.

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Of the total number of 3952 trees planted out on watersheds by the Division of Forestry during February and March mainly for the conservation of water, almost one-half consisted of the native koa, which has been proved suitable for this purpose where the soil is well drained.

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The Territorial Veterinarian points out in his routine report the folly of purchasing on the Pacific Coast, for introduction into the Territory, dairy cows from herds which have not been proved by repeated tests to be free from tuberculosis, and advises closer observance of the accepted laws which govern the spread of bovine tuberculosis by purchasing only from uninfected herds to prevent the establishment of new centers of infection in the Territory.

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The work of extending the areas of forest reserves and of placing them under better administration so that they will serve their purpose as water conservers, by fencing out cattle, exterminating those that are within and cannot be gotten rid of in any other way, by preventing other trespass, and bringing the forest back to normal by reforestation, continues to be the chief activities of the Division of Forestry.

The Board recently voted to make Ranger Hipple an allowance for the feed of his horse which he uses on official work in patrolling the forest reserve in Palolo, Manoa, and Nuuanu Valleys. Ranger Hipple has been giving his horse "Sure Milk," which is cheaper than barley and gives good results.

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The report of the Territorial Veterinarian that, after a thorough investigation of the horse-stock on the windward coast of Hawaii, no traces of glanders were found and that the very heavy glanders infection which had persisted in this district for years had been eradicated completely during the campaign of the Division of Animal Industry five years ago, is very gratifying.

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In his routine report, printed in this issue, the Territorial Veterinarian indicates the advisability, on the part of plantations and other owners of valuable work-stock on the windward coast of Hawaii, of providing more hygienic and sanitary stables in order to minimize the losses from *epizootic lymphangitis*, and emphasizes the great need of taking better care of the thousand work animals, upon which these plantations depend for their cultivation, the majority of which animals cannot be replaced for less than \$300.00 per head.

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The withdrawal of the non-water-producing Island of Kahoolawe from the forest reserve and the return of it to the jurisdiction of the Commissioner of Public Lands, described in this issue, should result in an increase in the meat supply in two ways—the placing on the market of the palatable meat of the goats which the new lessee will be required to remove, and the shipment to the market of cattle which the lessee will be allowed to fatten on the acres of pili grass and tons of algaroba beans now going to waste on Kahoolawe.

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## Division of Forestry

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Honolulu, April 17, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the months of February and March, 1918:

During February and a part of March I was absent from the Territory on leave in order to undergo a large amount of special dental work.

## TREE PLANTING.

Besides the usual tree planting on the Honolulu Water-shed forest reserve in Makiki Valley, reported on by the Forest Nurseryman, which consisted of the setting out of 1226 koa trees during February and March, there were planted out on the same reserve in Manoa on selected areas 1251 *Spathodea campanulata*, 483 *Ficus religiosa*, 294 koa, 236 *Albizia moluccana* and 12 *Ficus subtripplinervis*. The planting of some of these species is merely experimental to determine their adaptability to the region. On the Kealia forest reserve, Kauai, Forest Ranger Lovell planted out 200 silk oak and 250 ironwood trees along the makai boundary of the reserve just within the fence. These operations bring the total plantings on forest reserves during the two months up to 3952 trees.

In accordance with the standing offer for rendering assistance in forest matters, at the request of Captain A. L. C. Atkinson, the Division of Forestry has signified its willingness to assist in every way possible in the reforestation of certain areas on the military reservation at Schofield Barracks and more particularly by preparing a definite planting plan which can be followed in prosecuting all work of this nature in the future. Field work for this project will be undertaken as soon as weather permits.

## FOREST FENCING.

Forest Ranger Lindsay on Maui has submitted measurements and all data necessary for the construction of needed fencing along parts of the boundary of the addition to the Makawao forest reserve, Maui. It is planned to undertake this as soon as the addition has been set aside by proclamation.

Forest Ranger Mackenzie on Hawaii has investigated and reported on the needs of certain fence repairs along the makai boundary of the Kau forest reserve, Hawaii, in the region of the Waiohinu Springs and the matter will be taken up with the Land Commissioner to compel the holder of the lease to give it attention.

The fence at the northwest corner of the Hilo forest reserve in the region of Piha, Hawaii, is rapidly nearing completion. All the holes have been dug, posts cut and dragged to the fence line, and the wire is on the ground, but the heavy rains (23 inches during February) have filled up the holes with water and the posts can not be set and a good job made of it while the soil is so wet. By the end of April, however, the weather should permit of the completion of the job.

Informal consent was given to the project of moving over a mile of fence along the boundary of the Lihue-Koloa forest reserve, Kauai, where it crosses the privately owned land of Lawai, to a location further makai which will increase the area of the forest reserve by about 150 acres and also give greater



protection to the source of supply of drinking water for the Lāwai homesteaders. This is being done by the county through Mr. Walter D. McBryde and will obviate the necessity of extending the intake half a mile up the valley at an almost prohibitory expense.

#### ENFORCEMENT OF RULE III.

During the latter part of March the first arrest was made under Rule III of the Division of Forestry which prohibits trespassing on the forest reserve in upper Nuuanu Valley in the region of the reservoirs. The offender was found some distance off the road and was arrested by the police.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

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#### FOREST NURSERYMAN'S REPORT.

Honolulu, March 31, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR:—I herewith submit a report of the principal work done during the month of March:

#### NURSERY.

##### *Distribution of Plants.*

Sold . . . . .	135	pot grown plants.
Gratis . . . . .	251	“ “ “
“ . . . . .	1075	transplant boxes.
Total . . . . .	1461	

#### COLLECTIONS.

##### *Government Realizations.*

Collections on account plants sold . . . . .	\$ 2.65
Rent building Nursery ground, January . . . . .	35.00
Total . . . . .	\$37.65

*Preservation Forest Reserves.*

Collection for quarter ending March 13, 1918:

Rent and fees.....	\$ 43.25
283 loads black sand at 25c.....	70.75
Total.....	<hr/> \$114.00

*Plantation Companies and Other Corporations.*

The distribution of plants under this heading amounted to 60,000 in seed boxes, 1200 in transplant boxes and 60 pot grown, making a total of 61,260.

*Makiki Station.*

In addition to the regular routine work, repairs have been done on road and a new shed to store lumber has been built.

*Honolulu Watershed Planting.*

The work done consisted in the planting of 776 koa trees on bare land at the top of Makiki main valley, also hoeing and clearing.

*Advice and Assistance.*

The writer spent two days assisting in the judging of school gardens and home gardens at the request of the management of the Honolulu Star-Bulletin.

At the request of Captain A. L. C. Atkinson, the writer paid a visit to Schofield Barracks for the purpose of giving advice in the laying out of a nursery and the planting of trees around the Post.

Calls made, 7; advice by telephone, 12; advice given at Nursery, 6.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## Division of Entomology

Honolulu, April 13, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :—During the month of March the insectary handled 25,500 pupae of the melon fly, from which there were bred 823 females and 644 males of *Opius fletcheri*.

The distribution of parasites was as follows:

### *Opius fletcheri*.

	Females	Males
Oahu:		
Nuuanu . . . . .	193	148
Moanalua . . . . .	108	95
Ewa . . . . .	221	203
Molokai: Kamalo . . . . .	45	30
Hawaii: Glenwood . . . . .	250	209

### *Diachasma fullawayi*.

Oahu:		
Nuuanu . . . . .	40	25
Ewa . . . . .	20	5
Maui: Hana . . . . .	20	13

### *Diachasma tryoni*.

Oahu: Nuuanu . . . . .	85	30
Maui: Hana . . . . .	50	25

### *Opius humilis*.

Maui:		
Hana . . . . .	40	10
Haiku . . . . .	25	..

### *Tetrastichus giffardianus*.

Maui:		
Haiku . . . . .		50
Hana . . . . .		30

### *Galesus silvestri*.

Hawaii: Glenwood . . . . .	700
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*Dirhinus giffardi.*

Hawaii: Glenwood ..... 200

*Paranagrus osborni.*

Oahu:

Kailua . . . . . 7,800

Makiki Nursery . . . . . 3,600

Maui:

Paia . . . . . 1,400

Haiku . . . . . 12,800

Molokai: Pukoo . . . . . 4,100

Hawaii: Kohala . . . . . 500

Respectfully submitted,

DAVID FULLAWAY,  
Entomologist.

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## Division of Plant Inspection.

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Honolulu, March 31, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of March, 1918, as follows:

During the month of March there arrived at the port of Honolulu 47 vessels, of which 19 carried vegetable matter subject to inspection, which was disposed of as follows:

	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	604	14,957
Fumigated . . . . .	2	2
Burned . . . . .	47	47
Returned . . . . .	2	2
Total inspected.....	655	15,008

Of these shipments there were 14,726 packages of freight, 143 packages of mail matter and 139 packages of baggage belonging to passengers and immigrants.

### RICE AND BEAN SHIPMENTS.

During the month 15,124 bags of rice and 2338 bags of beans arrived from Japan and Oriental ports. After careful inspection they were found free from pests.



## PESTS INTERCEPTED.

Approximately 8490 pieces of baggage belonging to passengers and immigrants from foreign countries were examined and from the same 27 lots of fruit and 20 lots of vegetables were seized and destroyed by burning.

On March 8, a pot of ferns from Manila was fumigated and the soil removed, a beetle grub and a slug being found in the soil.

On March 15, a package of palm seeds from Ceylon by mail for the Board of Agriculture was fumigated to destroy a few ants found in the packing.

On the same date a parcel of tree peony roots in the mail from Japan was returned as unmailable.

On March 31, a package of seed corn by mail from Manila was burned, being a prohibited importation.

## HILO INSPECTION.

Brother M. Newell reports the arrival of no vessels for the month of March. Five packages of seed were inspected in the mail.

## KAHULUI INSPECTION.

Mr. Will J. Cooper reports the arrival of four vessels, two of which carried vegetable matter, consisting of 12 lots and 91 parcels of fruit and vegetables. All were found to be free from pests.

## INTER-ISLAND INSPECTION.

Fifty-two steamers plying between Honolulu and other island ports were attended, and the following shipments were passed as free from pests:

Taro . . . . .	681 bags
Vegetables . . . . .	288 packages
Plants . . . . .	141     "
Fruits . . . . .	13       "

---

Total passed.....1123 packages

Three packages of plants, on account of infestation and undesirable soil, and 8 packages of pineapples were refused shipment.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

## Division of Animal Industry.

---

Honolulu, April 18, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :—I beg to report upon the investigation of a supposed outbreak of glanders in the Hamakua district of Hawaii, as well as upon various conditions encountered on Hawaii and pertaining to the work of this Division.

During the month of January a letter was received from the manager of the Hamakua plantation in question stating that two mules had died from a disease believed to be glanders and that one was then sick. Previous to this a few cases had occurred from time to time, two of which had been diagnosed by the deputy territorial veterinarian as glanders. However, as no cases of this disease has been observed in that district since 1913, or anywhere else in the Territory, and as it was highly improbable that it could have been brought in with imported stock, some doubt was felt as to the correctness of the diagnosis.

A disease called *epizootic lymphangitis* and which clinically resembles glanders or farcy to a great degree, was described and illustrated in the annual report of this Division for 1906.

It was especially prevalent on Maui where two outbreaks occurred each of which caused the death of 13 plantation and road board mules. But also on Oahu and Hawaii has the disease been met with though in only scattering cases. It is very prevalent in China, India and Japan, and is frequently referred to as Japanese farcy. In these countries, however, it is far less virulent than is the case here and many cases recover, while here it invariably proves fatal.

*Epizootic lymphangitis* is a virulent transmissible disease characterized by the swelling and subsequent suppuration of the superficial lymph vessels, or affecting the mucous membrane of the nose in glanders-like fashion. It is caused by a specific micro-organism, a fungus (*saccharomyces farciminosum*) and not by a bacillus, as glanders is. That it is difficult to distinguish the two diseases from each other is best illustrated by quoting a sentence from a monograph on *epizootic lymphangitis* by Captain Pallin of the Army Veterinary Department of England. Captain Pallin says:

“The disease has from time immemorial been invariably confounded with glanders (farcy) and ulcerative lymphangitis, in whatever part of the world it has appeared, and even with the assistance of Mallein and modern science, veterinarians of nearly every nationality still continue to make the same mistakes.”

In certain of the West Indies the disease is said to decimate the mule population.

## THE HAMAKUA OUTBREAK.

By direction of the Board I left for Hawaii the latter part of January. At Hilo I was met by Dr. O. B. Shipman, Acting Deputy Territorial Veterinarian, who informed me that he had recently destroyed a typical case of glanders in a pack mule on a plantation a dozen miles north of Hilo (Pepeekeo); also that this animal was one of a drove of more than fifty head which had been gathered by a dealer, presumably in the Kohala and Waimea districts, and sold off in small bunches to many of the plantations in the Hamakua and Hilo districts. This necessitated a thorough inquiry as to the whereabouts of all of these animals. They were all located and no further cases were found nor did subsequent investigations at their place of origin disclose anything to indicate that they had brought any disease with them. In fact, the Pepeekeo case did not develop until several months after the animal had been bought.

This isolated case of glanders (?) in a district where the disease had not been known for years at first suggested that we were dealing with *epizootic lymphangitis* instead of glanders. This suspicion was confirmed when we reached the first of the Hamakua plantations in question (Honokaa). There we found three animals isolated, one mule and two horses. The mule had but a slight discharge from the nose, no swelling of the submaxillary glands, but extensive worm-like swelling of the lymph vessels on the inside of the thighs, from the tail nearly to the hocks, and studded with rounded nodules the size of pigeon eggs. A number of smaller but disconnected nodules were scattered over the neck, chest and flanks. This animal was mallein tested twice, intradermally, but failed to react.

The next, a gray saddle horse, had been running from the nose for several days. The discharge was not profuse but was blood stained, and formed sticky, brownish crusts around the nostrils. The submaxillary space was filled by a diffuse irregular swelling with soft centers. On the left side of the neck was a corded lymphatic with a few small nodules. This animal was also mallein tested twice with negative result.

The third animal, a horse belonging to an outsider, had been isolated as suspicious. When examined it showed only symptoms of Hawaiian nose disease and when it failed to react to the mallein tests it was released.

The two other animals were taken to the bluff overhanging the ocean and shot.

On post-mortem examination, the mule showed no distinct lesions in the nose, but the corded lymphatics and nodules on the hind legs and body were found to contain the thick creamy white pus characteristic of *epizootic lymphangitis*, some of them being almost ready to burst open, while others were hard and indurated.

In the horse the lesions in the nose were very pronounced,

the mucous membrane on both sides of the septum (the partition between the nasal chambers), but principally on the right side, being covered with well defined ulcers with swollen rounded edges, and the centers in two places almost penetrating the cartilaginous part of the septum, which at the lower end was thickened and spongy. On the right side the ulcerations extended to the upper nasal chamber and the turbinated bone, the latter being covered with irregular confluent granulating sores. The swelling in the submaxillary space and the nodules on the neck contained centers of thick white pus.

The stable from which these two cases had been removed contained some 120 animals, principally mules and the rest saddle horses. Since November, 1917, a total of nine cases have occurred in this stable, our deputies from both Kohala and Hilo having diagnosed them as glanders or farcy. The stable is located on an isolated section and is reached by a fifteen minutes ride on the plantation railroad. After each case the infected stalls had been thoroughly disinfected by the local Board of Health agent, and all wood work had been repeatedly treated with creosote or tar. Individual drinking troughs (soy tubs) had been provided in the mangers, and both animals and stalls were plainly numbered to prevent the promiscuous use of troughs and stalls.

About a dozen animals were segregated at one end of the stable as either exposed or suspicious, but the weather was so rainy and cold that a majority of the mules had more or less discharge from the nose. All of the 120 animals were submitted to the intradermal mallein test, but, as might have been expected, without a single reaction. The entire stable was again disinfected and it was strongly recommended that some kind of flooring be provided for the stalls; as it were, the animals were standing either on rough rocks or in mud holes, and as the mill was not running and the weather was wet, there were neither bagasse nor cane strippings available for bedding. These uncomfortable conditions in connection with a pronounced scarcity of feed—no barley, no cane tops, only alfalfa meal, molasses and rank grass (Natal red top)—would naturally tend to reduce the vitality and power of resistance of the animals to any form of infection which might be present, but which under normal or more favorable conditions the animals would be able to throw off. That such an infection is present cannot be doubted, and that it is one which is far more persistent than that of glanders is undisputed. In its favor remains the fact that it is not transmissible to man, that it cannot be transmitted by ingestion of either infected water or feed but must be introduced directly into an open wound or to the susceptible (catarrhal, inflamed or wounded) mucous membrane of the nose or eye. Where the disease is known to occur and where a sharp lookout is kept for swollen cords and nodules, as well as for the characteristic sticky discharge from the nose, it is not so difficult to recognize and guard



against as glanders, but no diagnostic test—like the mallein test—has as yet been evolved.

During the beginning of February a call was received from the adjoining plantation to the north. Upon arrival a large plantation mule which had been isolated was found to be badly affected with both the nasal and cutaneous form of the disease. There was no fever and no submaxillary swelling, nor did the animal react to either the intradermal nor the ophthalmic mallein test—three facts sufficient to establish the diagnosis of *epizootic lymphangitis* when considered in connection with the nasal discharge and the corded and noded lymph vessels on neck and hind-legs. On this plantation stable and feed conditions were even worse than on the one above mentioned. The stables were badly located, practically no drainage, and the floors were absolutely prohibitive against an animal lying down to rest. No cane tops, and grain impossible to obtain. Soggy rank grass, chopped, alfalfa meal and molasses constituted the feed on which the animals were supposed to work. A most thorough disinfection of the whole stable was begun at once, the disinfectant recommended by the Board of Health being employed in connection with quicklime for the floors.

The next case developed in an old mule which was kept in a sling on account of a badly injured hind-leg. Nodules and cords appeared all over the body and the animal was shot. There were no nasal symptoms. A week later two cases developed in quick succession, one in a separate stable across a gulch from the rest of them and the other in one of the already disinfected stables. Both were immediately segregated and mallein tested by three distinct methods, the intradermal, the ophthalmic and the subcutaneous test, but neither reacted in the slightest degree. One of these cases is remarkable in that it recovered, at least temporarily. The right hind leg was diffusely swollen and from a wound on the inside of the thigh flowed a profuse creamy white discharge, mixed with streaks of blood. As there were no cords or nodules and as it was a valuable animal, treatment was undertaken. This consisted simply in repeated ablutions of the wound with a strong disinfecting solution, and the application of mercuric ointment. In the course of two weeks the wound had healed and while there still remained some swelling of the leg the animal was able to go to work. Whether this is a permanent cure remains to be seen. On the other hand the case may have been one of simple suppurative lymphangitis which however is not likely on account of the color of the pus.

Mule No. 4 was a typical case, nasal as well as cutaneous. In order to dispel the last doubt as to the diagnosis a couple of guinea pigs had been secured. These animals are highly susceptible to glanders and will, when inoculated with the nasal discharge, develop the disease in from 6 to 11 days. Both were inoculated intra-abdominally with a syringe full of the nasal discharge of the mule, dissolved in normal salt solution. With

exception of a small nodule at the point of inoculation no symptoms of glanders had developed three weeks after inoculation, and the animals were eating well and had gained in weight. The mule had in the meantime been shot, the case becoming generalized and highly offensive but retaining its appetite almost to the last.

The continuous rains—from 5 to 10 inches and more nearly every day—and the unfortunate feed conditions had caused a good deal of sickness and several deaths of a non-specific character, and had the mill not begun grinding and cane tops become available, most of the field work would undoubtedly have come to a stop. A number of visits had been made to the plantation first mentioned and to one further south, but no more cases were met with after cane tops and some barley were again fed.

In view of the fact that the last authentic case of glanders observed in the Territory had occurred in Waipio Valley where 40 head were destroyed and many more died during 1912, a thorough investigation of that locality was decided upon. All horse stock was rounded up, 171 head, and a list made of the names of the owners and the number belonging to each. After inspection, the valley was searched for additional animals and a few were found, but none showing any symptoms of disease. From former experiences, the possibility of diseased animals being hidden in the gulches beyond Waipio was not excluded, so a party including the police and Board of Health officers, as well as Dr. Shipman and myself, undertook to search this very difficult district. All of the nine gulches beyond Waipio and including Waimanu were explored, but only in the latter did we find about thirty head of horse stock and they were all healthy. It would therefore seem safe to conclude that the very heavy glanders infection which had persisted in this district for years had been eradicated completely during the 1912-1913 campaign.

The difficulty of this Division dealing with a severe outbreak of disease among the live stock in the Hamakua district is manifest. Our two deputies are located, one at Hilo and one at Kohala, so for either to visit Kukuiahaele for instance, and return home, would require their traveling from 100 to 150 miles over bad roads, with the possibility of having to return the next day to diagnose a new case. A plantation manager can, of course, quarantine and destroy his own animals if he deems it necessary, but what of the hundreds of animals belonging to the villagers, tradesmen and homesteaders, who will take no such measures unless compelled to. And it is these animals that come and go and are sold or hidden out as soon as they show any suspicious symptoms, which are a constant menace to the plantation and ranch stock in any district.

Under these circumstances an effort was made to have the principal live stock owners in the Hamakua and Waimea districts provide for the permanent employment of a first class veterinarian, to be invested with the authority of a deputy ter-

ritorial veterinarian by this Board, to be stationed at Honokaa, and who would not alone act officially in so far as infectious and contagious diseases were concerned, but would attend to all medical and surgical cases occurring in the stables or on the premises of those contributing to his salary. This project, however, met with so little encouragement from the two plantations which would seem to need its consummation the most that, even though the Parker Ranch had already pledged its participation, it had to be, at least temporarily, abandoned.

And still, to judge from the best authorities on the subject, it is very unlikely that *epizootic lymphangitis* has been permanently suppressed on these plantations nor is it likely to be until at least more hygienic and sanitary stables are provided and recurrences guarded against by constant professional supervision.

As a substitute measure it was suggested that the local Board of Health agent be appointed an agent or live stock inspector by this Board. The officer in question, who is also invested with police authority, had been active inspecting all horse stock outside the plantation stables with a view to tracing the source of infection. His report to the chief sanitary inspector at Hilo pertaining to the work elicited a reply containing the following lucid comments:

"As an agent of the Board of Health, your authority does not extend to animal quarantine work. We are at all times ready and willing to assist the Department of Agriculture and desire that in this case you do all you can to assist in the eradication of glanders. You are cautioned against placing any animals in quarantine unless such animal has been declared to have a communicable disease by a Territorial veterinarian. When this has been done, if you are asked to assist, you may. In no case do we handle the matter. We work with the Department of Agriculture. Sec. 508, R. L. 1915, provides for quarantine by the Board of Agriculture as follows:

"**Quarantine: Destruction Diseased Animals:** The Board shall have the power to quarantine any domestic animal known to be affected with or to have been exposed to any contagious, infectious or communicable disease, and to destroy the same, when in the opinion of the Territorial Veterinarian, or in his absence, a duly qualified veterinary surgeon, such measure is necessary to prevent the spread of such disease, and to provide for the proper disposition of its hide and carcass; and to disinfect premises where any such disease may have existed."

"I would suggest that Dr. Nørgaard give you a commission as agent for the Board of Agriculture and Forestry; you may then act for him."

This spirit of coöperation by the officers of the Territorial Board of Health is thoroughly appreciated but it is doubtful whether the said agent's appointment as a live stock inspector of this Board would add to the scope of his authority, as every section of Chapter 37, R. L. 1915, *Agriculture and Forestry*, pertaining to this work, requires the diagnosis to be made by the Territorial veterinarian or a duly qualified veterinary surgeon,



as above quoted. Even Section 505 pertaining to the appointment of live stock inspectors cannot be interpreted to invest such inspectors with professional ability that would obviate the veterinarian, while Section 513, *Reporting disease*, makes it imperative that *any person* knowing of or having reason to believe that an animal is suffering, etc., shall report same forthwith to a territorial veterinarian, etc. It would therefore seem that in case this dangerous and destructive disease, the origin of which is unknown, should persist in the Hamakua district, and perhaps spread to neighboring districts, the employment of a veterinarian will become imperative. At the same time it seems incomprehensible that a chain of plantations with perhaps one thousand work animals, upon which they depend absolutely for existence, and the majority of which cannot at the present time be replaced for less than \$300.00 per head, should be willing to leave their health, that is their working capacity, to the tender mercies of ignorant stable hands, when the saving of one or two per cent of the animals per year would pay for the services of a competent veterinarian.

#### BOVINE TUBERCULOSIS CONTROL.

From a large number of tuberculin tests applied by myself, or in company with Dr. Shipman, it would appear that bovine tuberculosis is far from being as prevalent on Hawaii as it is, or has been, on Oahu. Out of a bunch of 14 imported Hereford bulls at Naalehu, Kau, one had died and the organs were sent to Hilo for diagnosis. They were found to be badly affected with tuberculosis, and fearing that the remaining bulls might infect the entire herd of several thousand cattle on a ranch where the disease had never been known before, the manager's request to have them tested was complied with. We were at the time testing the dairies around Glenwood, where five reactors were found in one herd. A machine was sent for me from Naalehu and subsequently returned me to the Volcano House. One of the imported bulls in question reacted to the tuberculin test and was appraised and slaughtered. It was but slightly affected in both lungs. The lesions were of recent origin and the disease must have been contracted from the bull that had died first. At Pahoa we tested seventy head without a single reactor, nor were any found in the Hamakua district.

Referring to the appended report of the Assistant Territorial Veterinarian suggesting an amendment of the present law governing the payment of indemnification for cattle which have been less than six months in the Territory, it will appear that the last sentence in Section 4, which reads:

“Provided, that no payment shall be made for an animal which has been in the Territory for a period of less than six months prior to the date of slaughter.”

might be effectively altered.



The aim of the proviso is plainly that anybody importing an animal affected with tuberculosis shall receive no compensation, if the same is found, within six months from the date of importation, to be suffering from tuberculosis, and this again implies that all imported dairy cattle shall be tested prior to the expiration of that term, in order to decide their qualifications for indemnity. The trafficking in tuberculosis cattle which has been carried on here, and the importation of cattle from dairy herds in California which upon test show 25% reactors (20 reactors out of 79 tested), and of which the "*passed as healthy*" ones show 7 reactors out of 30 head tested after they have been in a healthy herd in the Territory for less than four months, would seem to indicate either absolute disregard or else ignorance of the accepted laws which govern the spread of bovine tuberculosis, and as all importers of dairy stock have been warned time and time again, by word of mouth and through published reports and articles against purchasing stock from infected herds—test or no test—it is not likely to be ignorance.

Mr. W. E. Bellina has for years kept the largest dairy herd in the Territory practically free of tuberculosis, so what induced him to purchase the 50 California cattle, after 20 reactors had been rejected by the inspector, and in addition purchased a number of Mr. Chas. Bellina's Halawa herd, is not easily explained, unless he wanted to make certain of infecting his own herd. No compensation was paid for the imported tuberculous animals, nor will any be paid by sanction of this office whether tested before or after the six months period, so long as post-mortem evidence and the history of the imported cattle indicate that they were diseased or infected at the time of purchase. This office will continue to keep *en rapport* with the Federal Bureau of Animal Industry offices in San Francisco, Portland and Seattle, and all animals purchased from infected herds will be tested before they have been here six months and the reactors destroyed without compensation. The Bovine Tuberculosis Compensation Act (Act 121, S. L. 1917) authorizes and empowers this Board to take measures "*for the prompt prevention, suppression and eradication of bovine tuberculosis*" and if there has been any doubt about it before, it is now stated *most emphatically*, that this office will not temporize with any efforts to continue the disease in the Territory.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, April 11, 1918.

DR. V. A. NÖRGAARD, Chief, Division of Animal Industry,

Bureau of Agriculture and Forestry, Honolulu, T. H.

SIR:—I beg to submit the following report for the month of March, 1918:

*Tuberculosis Control.*

During the past month the following cattle were tested for tuberculosis:

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
J. A. Cummings.....	9	8	1
Oahu College .....	16	16	0
College of Hawaii.....	17	17	0
Mills School .....	24	23	1
K. Mitsunaga .....	5	4	1
C. R. Frazier.....	6	6	0
James Leach .....	1	1	0
Lunalilo Home .....	21	21	0
W. E. Bellina.....	425	415	10
O. R. & L. Co. (Mokuleia)	554	551	3
O. R. & L. Co. (Kawailoa)	77	77	0
Y. Ogawa .....	9	9	0
Antone Martin .....	16	16	0
S. Huginaka .....	6	6	0

Out of a total of 1186 head of dairy cattle tested during the month 1170 were passed and tagged and 16 condemned and branded.

It is interesting to note that the tests disclosed 10 tuberculosis animals in Mr. Bellina's herd. The animals were divided as follows: 7 imported California cows only four months in the Territory and 2 heifers and 1 cow purchased from Mr. C. H. Bellina. Not one animal in the original herd showed signs of tuberculosis and it was therefore a clean herd before these two purchases.

Of the 7 imported cows, 4 have been slaughtered and lesions of tuberculosis found in all. The stage and condition of these lesions demonstrated beyond the shadow of a doubt that they were present in these animals at the time they were tested on the Mainland and for some reason the subcutaneous test—the method used at that time—failed to detect them. At the time of retest here, four months later, they gave distinct reactions to the intradermal test, the approved method of testing in this Territory.

The above cattle were open to no chance of infection during the time they were in the Islands as they were brought into a clean herd as proved on recent test, therefore the conclusion must

be that they brought the disease with them and this was amply proved by a close examination of the lesions present in the body. This leads us to a consideration of the degree of protection afforded by our present regulations covering the importation of cattle into the Territory.

In this connection I would suggest that our present regulations on the subject be repealed and that a new regulation be promulgated providing for testing of all cattle whether of dairy or beef breeds upon their arrival in the Territory, except in those cases where said cattle are accompanied by a certificate signed by the Chief Veterinarian of the State from which they come, to the effect that said cattle come from a herd proved, by repeated tests, to be free from tuberculosis for a period of at least two years immediately preceding date of shipment. Such a regulation would, I believe, be of great assistance at the stage of tuberculosis control and eradication which we have now reached; it would minimize to the last degree the danger of the spread of the disease from new centers of infection caused by the importation of diseased cattle which had failed to show a reaction to the subcutaneous test; it would conserve our indemnification appropriation, and finally it would put a premium on the purchase of cattle from accredited tuberculosis-free herds. To sum up, we would have a much better control of the situation and be in a better position to prevent the introduction of the disease from abroad.

#### *Post-Mortem Inspection of Condemned Cattle.*

Fourteen condemned cattle from various dairies were inspected at the different abattoirs. All presented lesions of tuberculosis in varying extent. In only two cases were the lesions so extensive and the carcasses so emaciated as to necessitate entire condemnation. No compensation was paid on four head as they had been in the Territory but four months.

#### *Importations of Live Stock.*

S. S. Lurline, San Francisco: 121 Holstein cows, 1 Holstein bull, C. H. Bellina; 1 Berkshire boar. This shipment is notable in the fact that it is the largest individual importation of dairy cattle in many years and for the high grade of the animals included in it. 1 Holstein cow, E. F. Bishop; 50 Merino rams (New Zealand), Parker Ranch. A very even lot of rams and a good representation of this particular type of Merino. 9 crates poultry.

S. S. Manoa, San Francisco: 1 dog, B. F. Lee; 6 crates poultry.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

## Marketing Division

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Honolulu, April 1st, 1918.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H. |

GENTLEMEN:—I respectfully submit the following report of the Territorial Marketing Division for the month of March, 1918:

The sales for the month amounted to \$13,121.45, which is \$6826.80 less than the sales for the previous month, but this is to be expected as we received very few large consignments during the month. Most of the consignments received consisted of pumpkins, bananas and cabbage.

The bean crop is about cleaned up and there will be very few large consignments received until the corn crop is harvested. Large areas of land have been planted to corn, and if the weather is favorable there will be an exceptionally large crop. A good portion of this will be made into corn meal for the local market.

Very few sweet potatoes were received during the past month, causing the price to advance to \$1.75 a hundred pounds. This price will not remain long as sweet potatoes will be plentiful in about four to five weeks.

Mr. C. C. Conradt, of Molokai, has written us that he will have about one thousand bags for the market during the next three months, which he intends to ship to the Division. These potatoes are starting to come in now, in twenty-five sack shipments, and we find them exceptionally good, being of the Madera variety and well graded.

The Reo truck purchased during the month has been a great help to the Division. We have been able to make prompt deliveries, and it has not been necessary for us to hire outside trucks.

The financial statement and trial balance for March is enclosed herewith.

Respectfully,

O. B. LIGHTFOOT,  
Acting Superintendent.



## Territorial Fair Exhibit

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*Plan of Exhibit of the Board of Agriculture and Forestry at the First Territorial Fair, June 10-15, 1918. Approved by the Board on April 24, 1918.*

### *Division of Forestry.*

- I. Forest Extension.
  1. Nursery stock of seedlings and transplants in boxes, pots, and tubs.
  2. Forest and ornamental tree seed pods and seed.
- II. Forest Protection.
  1. Working erosion model showing beneficial effects of forest cover and runoff.
  2. Standard forest reserve monument, cloth posters, list and maps of forest reserves.
- III. Miscellaneous.
  1. Stands of wood specimens of introduced and native trees.
  2. Samples of bamboo growing in Hawaii. (At the special request of the Fair Commission.)

### *Division of Animal Industry.*

- I. Charts showing:
  1. List of animal diseases kept out of Territory by inspection and quarantine.
  2. List of animal diseases which have gained entrance.
    - a. Statistics and methods showing those which have been eradicated.
    - b. Statistics showing methods and rate at which others have been reduced.
- II. Specimens of organs resulting from diseases listed in I, a. and b.
- III. Photographs of stock.
- IV. Miscellaneous.

### *Marketing Division.*

- I. Display of island produce showing how it should be properly graded and packed for shipment to market, as follows:
  - a. *Bananas*, packed in leaves for shipment.
  - b. *Beans*, packed in double sacks graded and in single sacks not graded.
  - c. *Cabbage*, packed in crates and in bags.
  - d. *Eggs*, stamped and packed in twelve dozen H. D. egg crates and thirty dozen Standard egg crates.
  - e. *Onions*, packed in crates and bags and a few onions showing the different methods of curing.





MAHOGANY TREES FIVE YEARS OLD ON KALAKAUA AVENUE  
PARKING, HONOLULU.

- f. *Pineapples*, packed in crates for shipping to the Coast.
- g. *Potatoes*, graded and not graded.
- h. *Poultry*, shipped in rough crates and in collapsible chicken crates.
- i. *Strawberries*, packed in quart baskets and in bulk.
- j. *Tomatoes*, packed in Chinese baskets, berry baskets and tomato crates.

## II. *Island Corn and Beans.*

Sample bottles of as many varieties of island corn and beans as can be obtained.

Note:—Exhibits for the Division of Entomology and Plant Inspection have already been planned for by the Economic Entomological Committee of the Territorial Fair Commission.

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# The True Mahogany Tree

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By C. S. JUDD, Superintendent of Forestry.

The term "mahogany" with or without some qualifying word such as "Indian," "African" or "Philippine" is applied to many cabinet woods grown in widely separated parts of the world. These so-called mahoganies belong to 67 distinct species of 41 genera and they are scattered through 18 families of the vegetable kingdom. Even the wood of the native koa, *Acacia koa*, has been placed on the San Francisco market as "Hawaiian mahogany." This has all led to the bewildering ambiguity of the term "mahogany" and, to add to the confusion, true mahogany has many names and several more or less distinct varieties are recognized commercially.

The true mahogany is produced only by two closely related species of tree, *Swietenia mahogani* and *Swietenia macrophylla*, both natives of tropical America. The former grows very well in these islands and quantities of seedlings are raised for distribution each year at the Government Nursery from seed produced on an old tree on King street near Piikoi street, Honolulu. The trees in the center parking on Kalakaua avenue on the way to Waikiki are the true mahogany and recently a 2¼ acre plantation of this species was set out in lower Makiki Valley to test out its habits of growth under close planting conditions.



## Withdrawal of Kahoolawe from the Forest Reserve

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Pursuant to the published notice, which appeared in the last issue of *The Forester*, a public hearing of the Governor and of this Board was held at the office of the Board on King street, Honolulu, on April 4, 1918, to consider the withdrawal of the Island of Kahoolawe from the forest reserve in order to return it to the jurisdiction of the Commissioner of Public Lands, who alone has the power to lease government lands, so that the demands for increased pasturage for fattening cattle for the market could be met.

The hearing which lasted for 2½ hours was well attended and much interesting information concerning the past history of the island and its present condition was revealed.

It was brought out during the hearing that Kahoolawe was not one of the water-producing reserves which are of prime importance to the main industries of the island on account of water conservation and was therefore a side issue in the main forest work which confronts the Territory; that, so far as the reforestation of the island is concerned, the algaroba tree has been spread by stock and is now satisfactorily established by the thousands on about two-thirds of the island wherever there is good soil; that it would be a foolish waste of money to attempt to reforest the bare top of the island; that for the good of the island the remaining sheep and goats should be exterminated or entirely removed; that the Board had attempted in almost every possible way to accomplish this with the result that during the past eight years approximately 5000 goats had been eradicated, but about 1000 remained, and it was difficult to induce anyone to clean these up; that there is a vast area of pili grass valuable for fattening cattle for the market and tons of algaroba beans on the island going to waste annually; that under a carefully prepared lease of the island with due restrictions and limitations good use could be made of these and at the same time the goats could be required to be exterminated; and that only the Land Office could issue such a lease.

In order to accomplish this it was necessary to change the status of Kahoolawe as a forest reserve and return it to the list of public lands which may be leased.

This was accomplished by the promulgation of the proclamation, appearing in this issue, which was signed by the Governor on April 20, 1918.

It is now proposed to offer a lease of the island under the following conditions which have been agreed upon by the Governor and the Land Commissioner:

- "1. The extermination immediately of all goats on said island.
- "2. That not to exceed 200 head of beef cattle be pastured

on the island, unless, after inspection, the Land Commissioner decides a greater number can be properly sustained.

"3. That a suitable number of horses be kept on the island to spread kiawe beans and extend the forest area.

"4. That the grass or beans be so pastured that danger of fire will be reduced to the minimum.

"5. That rigid restrictions be stipulated against the use of fire and matches.

"6. That some system of water catchment and storage of same be provided for by the lessee.

"7. That the land commissioner make such other conditions that seem to him just and reasonable.

"8. That the interest of the lease is primarily to conserve and restore the island to its utmost value.

"9. That the present purpose of the lease is to develop the island rather than to extract an extreme rental that would tend to force exploitation."

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### PROCLAMATION

o f

#### WITHDRAWAL FROM THE FOREST RESERVE OF THE ENTIRE ISLAND OF KAHOO LAWE, COUNTY OF MAUI, TERRITORY OF HAWAII.

Under and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915 and of every other power me hereunto enabling, I, LUCIUS E. PINKHAM, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry and of the Commissioner of Public Lands, having held the hearing of which notice has been duly given all as in said laws provided, hereby withdraw from the forest reserve the entire island of Kahoolawe, County of Maui, Territory of Hawaii, which was set apart as the Kahoolawe Forest Reserve by Proclamation of the Governor of Hawaii on August 25, 1910.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed. Done at the Capitol in Honolulu this 20th day of April, A. D. 1918.

(Seal)

LUCIUS E. PINKHAM,  
Governor of Hawaii.

By the Governor:  
CURTIS P. IAUKEA,  
Secretary of Hawaii.

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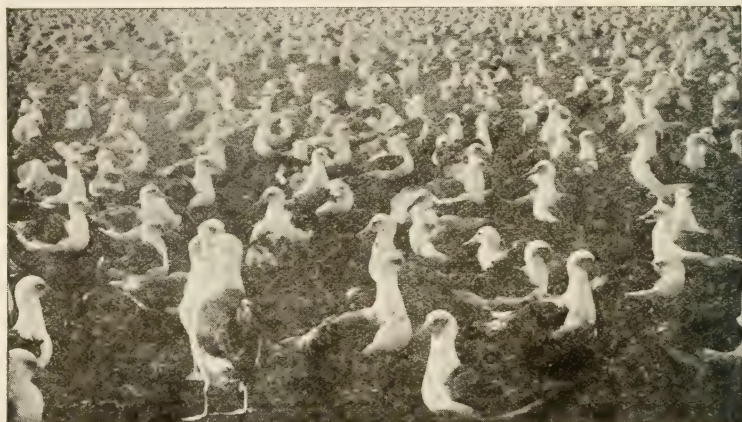
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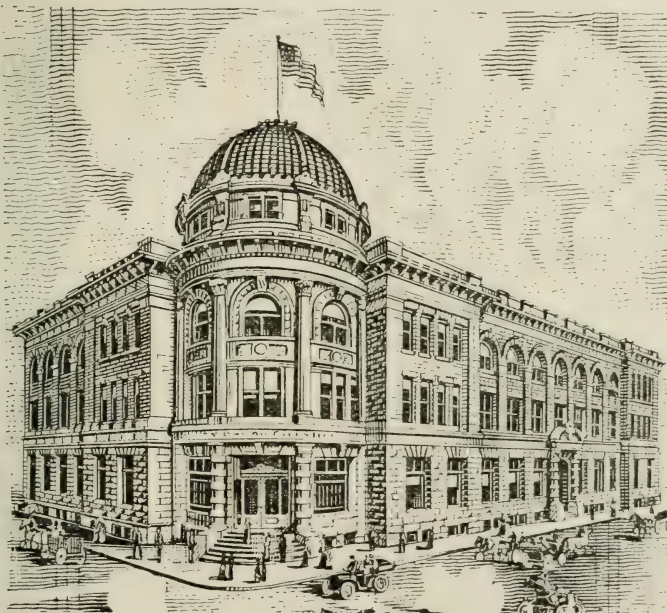


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(1918)

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

MAY, 1918

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To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

HONOLULU, MAY, 1918.

NO. 5

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## FORESTRY AS APPLIED IN HAWAII.\*

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By C. S. JUDD, *Superintendent of Forestry, Territory of Hawaii.*

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### I. FORESTRY IN GENERAL.

#### FOREWORD.

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The popular conception of the scope of forestry is varied and it is often difficult to disillusionize some minds of the idea that the work of the forester is simply to plant tender seedlings or to enjoy aesthetic ambulations in the green woods, or that the forester is a mere botanist, a landscape architect or a mere orchardist.

#### LIFE AND QUALIFICATIONS OF A FORESTER.

An old forest officer in India once said: "The life of a forester is not cast on a bed of roses, but rather a bed of thorns. An iron constitution and a good conscience may enable him to surmount all his difficulties."

The experiences encountered in the life of a forester are so numerous and the work which he must undertake in different regions is so varied that it were possible to recount but a small part in this brief paper. His work often takes him into the backwaters of civilization. He must have the capabilities of a Jack-of-all-trades and be able to mix well in frontier communities. From the Igorrote forest guard on his beat in the Philippine jungles wearing his forest badge pinned on to nothing but a gee string, to the forest ranger on snowshoes scaling logs in the woods of Oregon in a temperature of sixteen degrees below zero, the successful forest officer of well rounded experience must have, in a greater or less degree, the faculty to learn quickly new regions, the ability to handle men, the power to think and act in

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\* Delivered before the Social Science Association of Honolulu, May 6, 1918.



emergencies, the faculty of subordination to authority and of maintaining discipline, and self-reliance.

I am acquainted with rangers in Wyoming who are experts in the cattle range business; I have hiked with rangers through the dense forests on the west coast of Oregon who had never been on a horse, and the ranger in Alaska works in a region where the motor boat takes the place of the saddle and pack horse; hip boots and a slicker, the place of chaps, and it is much more essential that he knows how to adjust a spark plug than to be able to throw a diamond hitch.

#### PUBLIC SERVICE, THE SLOGAN OF THE FORESTER.

In all his work the forester must bear well in mind the fact that the welfare of the people, not only of the present but of the future, must be his endeavor and that the forest is the medium through which he works.

It has been well said that the successful forester is the one whose life and work contribute most fully to the necessity, convenience, and pleasure of the greatest number of people. Public service, therefore, is the byword of the forester, and it has often been asserted that the forest policy of the National Government is the longest look ahead that the United States has ever taken in any direction.

#### FORESTRY DEFINED.

To come to a definition of what forestry really is, we may state that it is the science and art of managing forests in continuity for forest purposes, i. e. for wood supplies or forest influences and it is in the latter that we are chiefly interested here in Hawaii.

#### THE FORESIGHTEDNESS OF FORESTRY.

The central idea of forestry is the intelligent and foresighted use of a great natural resource. Forestry is distinct from arboriculture, which deals with individual trees, for it has to do with single trees only as they stand together on some large area whose principal crop is trees.

#### SUPPLY FORESTS.

Our civilization is built on the chief product of the forest which from the cradle to the coffin, in some shape or other, surrounds us as a convenience or a necessity. The uses of wood are multifarious and it is safe to say that 99 per cent of all wood is used in supplying real needs.

Over half of the people in the United States live in wooden houses and the houses of the other half require wood as an indispensable part of their construction. More than two-thirds use wood as fuel and for every 100 tons of coal mined, 2 tons of mining timber are needed. There is hardly a utensil, a tool, or

even a machine, in the construction of which wood has not played a part, were it only to furnish the handle, or the mould or pattern. Even with the increased substitution of steel, concrete, brick, and tile, for wood, there will always be need for all the wood that can be grown in the United States, where the annual consumption per capita is 260 cubic feet which is ten times that of France. This consumption for many years has been far in excess of the growth, hence the strong demands on the forests for wood.

Water, also, may well be considered as another product of the forest which is of vital importance to mankind. "But the intimacy of the relation of the forest to the daily life of the individual now, is as nothing compared to what it will be when the coal, oil, and gas are exhausted; when our great source of power and heat comes, all of it instead of a part of it, out of the forest, and when the daily life of every man is intimately affected by the resources, revenues and utilities produced by electricity derived from water flowing out of the forests."

#### PROTECTION FORESTS.

Apart from their intrinsic productive value as briefly outlined above, to maintain which in perpetuity, the practice of forestry is essential, the forests have an influence generally beneficial to a country. They act as equalizers of the flow of streams by diminishing in general the frequency and violence of freshets and increasing the low-water flow and by preventing erosion of the soil. Recent investigations in India have shown that forest denudation is highly injurious to regulated stream-flow. In the United States on account of forest denudation at the headwater of streams it is estimated that one billion tons of the most fertile soil on the most fertile land in the country goes annually into the ocean. This is one of the largest losses that the nation suffers.

#### PREVENTION OF RUNOFF.

The forest is one of the most effective means of preventing erosion for it protects the soil and stores the water. The force of the rain is broken by the trees, the underbrush, and the litter on the ground so that it does not beat upon the soil. Much of the precipitation reaches the earth by running down the twigs and branches. In a heavy rain the water drips down so quietly as to have practically no beating effect upon the soil. There is no perceptible surface run-off until great quantities of rain have fallen. Instead, the water is soaked up by the organic matter or humus in the upper layers of the soil and as the rain falls it is absorbed by this sponge-like ground cover, is then passed on to the reservoir of mineral soil beneath and finally fed out gradually to the springs and streams. The surface run-off is also checked by the mechanical obstruction offered by stumps, fallen twigs, moss, and branches, and even whole trees and percolation of the

water into the soil is made easier by the network of small roots and the channels left by the decay of large roots. Such is the beneficial influence of forests on run-off.

#### INFLUENCE OF FORESTS ON CLIMATE.

Other forest influences of a beneficial character exist but are difficult to measure. The effects of forests on climate have been studied in Europe and while ideas as to the elements which enter into the problem have been cleared up, the real object of inquiry has not yet been finally solved because methods of meteorological inquiry and instruments are as yet unsatisfactory. For instance, rain-gages may register amounts varying from 7 to 40 per cent according to their construction and position and the character of the wind and rain during the same storm. The problem is too complicated for our present means to be settled by the mathematical method.

It has not yet been proven that forests produce rain. Because of this inefficiency of mathematical measurements, we are thrown back on the method of general observation in the field and the conclusion has been that the tendency of a forest cover is to reduce extremes of high and low temperatures and, on account of its cooling effect, to keep the air within the forest and that above it, nearer to the saturation point and as a consequence it might occur that moisture bearing currents passing over would precipitate their moisture more readily above or near the forest growth.

The forest, however, positively acts as a windbreak by breaking the velocity of dry winds and possibly enriching them somewhat with moisture and reducing the rate of evaporation over a neighboring field. It also acts as a protection against cold winds.

As far, then, as forest influence on climate is concerned, we must admit that no satisfactory conclusions have positively been reached excepting as to this favorable wind-break effect. It is reasonable to assume, however, that wholesale forest destruction and removal must change the climatic conditions of the denuded area.

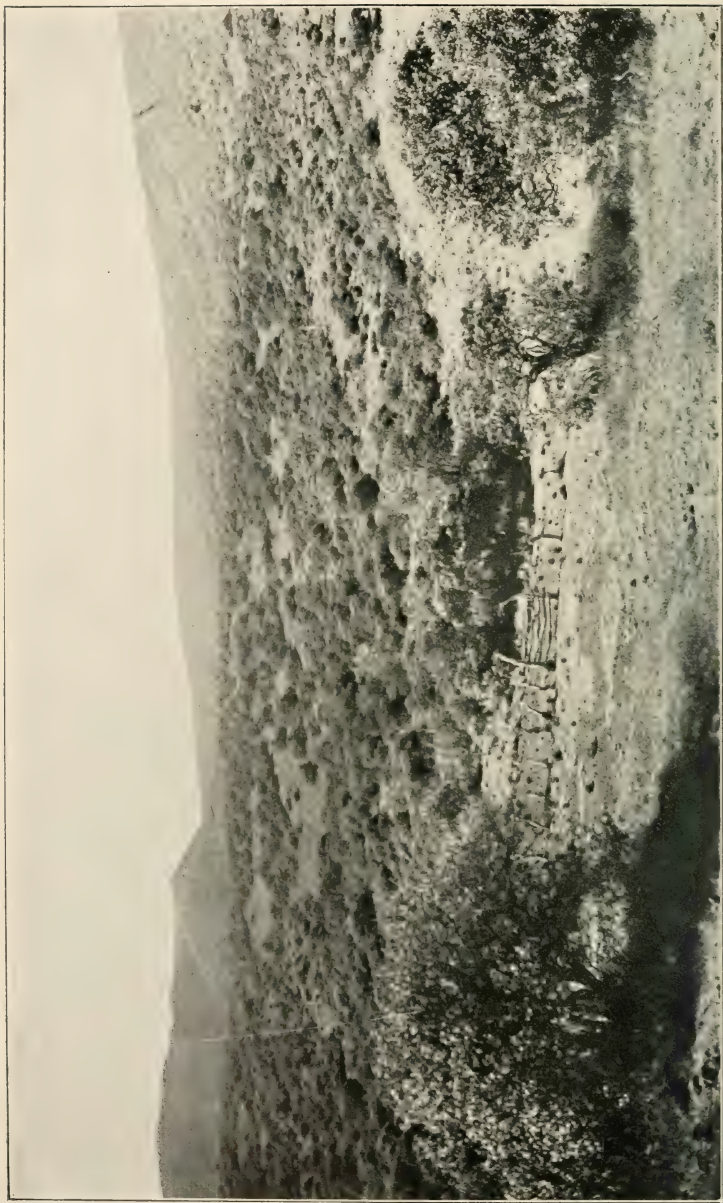
#### VALUE OF FOREST FOR RECREATION.

There are other beneficial and indirect forest influences of minor importance and one of these, which must not be overlooked in our modern economy of city life, is "the recuperation of bodily energy and of spirit which an occasional sojourn in the cool, bracing, and inspiring forest air brings to the weary dweller of the city. This is an element in the general health conditions of a people which must not be neglected."

"From every point of view the forest is one of the most helpful friends of man and perhaps no other natural agent has done so much for the human race and at the same time has been so recklessly used."

2600 :  
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THE MAMANI TYPE AT 7500 FEET ELEVATION ON THE NORTH SLOPE OF MAUNA KEA, HAWAII.

## EVOLUTION OF FORESTRY.

"The history of the forest in all forest countries shows the same periods of development.

"First, hardly recognized as of value or even as personal property, the forest appears as an undesirable encumbrance of the soil and the attitude of the settler is of necessity inimical to the forest; the need for farm and pasture leads to forest destruction.

"The next stage is that of restriction in forest use and protection against cattle and fire, the stage of conservative lumbering. Then some positive efforts to secure regrowth by fostering natural regeneration or by artificial planting: the practice of silviculture begins.

"Finally, a management for continuity—organizing existing forest areas for sustained yield—forest economy is introduced."

## NEED OF FORESTRY.

It has been said that the longer a country is inhabited, the poorer it becomes in forest growth and water. Private interest, private enterprise, as a rule knows only the immediate future, has only one aim in the use of the forest, viz: to obtain from it the greatest possible personal and present gain. A lumberman is a dealer in trees, with an eye to present profit and comparatively small regard for future conditions. A forester, on the other hand, aims to keep the land productive, to treat timber lands so that they will produce continuous crops of wood. This policy necessitates some present money loss and calls for the avowed intention of holding land as an investment.

The protection of the interests of the aggregate against those of the individual necessitates government control whenever a communal interest would suffer by the unrestricted exercise of individual rights.

This necessity was felt early in the world's history but it was not until about 1359 that forestry really began to be practiced in continental Europe. Forest protection and methods of silviculture were put into effect which involved the proper age at which timber should be cut, methods of thinning and of securing reproduction both naturally and by replanting. The science of determining the rotation for the production of wood has now been so far advanced that for the past 150 years timber has been raised in the same manner as any agricultural crop and it has been possible by growth and yield studies to predict centuries in advance just what the future wood crops will be.

## HISTORY OF FORESTRY IN THE UNITED STATES.

The United States was slow to take up forestry because it was confidently believed that the forest resources in the vast stretches of country in the middle west, south, and far west were inexhaustible.

But the increasing floods and the shortage of wood in some places by the conversion of heavy virgin forests into stretches of waste land made the people finally wake up to the fact that something had to be done before it was too late.

The first real forest legislation was in 1876 and in 1886 a Division of Forestry was created in the Department of Agriculture. In 1891 the President was authorized to establish forest reserves and many were set aside but were indifferently managed with an inefficient force.

In July, 1910, this Division became the Bureau of Forestry, and in March, 1905, changed its name to the Forest Service. At this time it also took over from the Interior Department the reserves which they then began to call National Forests. Many of the States also took up forest work accompanied by necessary legislation. Private interests placed many stumbling blocks in the progress of forestry which was made difficult because of the fact that three-fifths of the standing timber had already passed from government control into private hands, but the present system of National Forests which were created to produce a perpetual supply of timber for home industry, to prevent destruction of the forest cover which regulates the flow of streams and to protect local residents from unfair competition in the use of the forest and range, is a monument to those far-sighted men such as Pinchot who fought hard and valiantly in the early days to place the whole National Forest enterprise on the basis of permanence.

#### NATIONAL FOREST ACTIVITIES.

The net area of National Forests now owned by the people is over 150 million acres and the activities of the Forest Service extend from the Atlantic States to the Pacific Coast from Mexico to Alaska and an efficient organization has gradually been built up to handle the work of protection of the Forests and the development of their resources.

In only twelve years the National Forests have been extended to cover an area more than four times that of all the forests of the German Empire and the Forest Service has won the respect and confidence of the body of right-minded people all over the West as well as the East.

The average area administered by a Forest Service Ranger on a National Forest is over 140 times greater than the area administered, until recently, by a man of equivalent rank in a German forest.

The activities of the National Forest force cover a wide scope and extend from protection against forest fires, which is always considered the work of paramount importance, to the construction of thousands of miles of roads, trails and telephone lines, the extensive planting of trees to reestablish forests destroyed in part by fires, the carrying on of research and experiments to aid in the development of the best methods of forestry, the survey of



forest resources, classification and segregation of agricultural land, the selling of mature timber and the improvement of grazing areas in certain forest regions where the supply of water is not involved by regulated allotments of the herds.

An appropriation of ten million dollars to become available at the rate of one million a year was recently made by congress to develop roads within the National Forests and the importance of having public forests at the headwaters of important streams was recognized and greatly emphasized through the appropriation in 1916 of three million dollars for continued purchases of forest lands begun under the Weeks Law.

In this manner a vast area on the mainland is now managed with a view to the most general, varied and harmonious use. Through successful administration the permanence of the National Forests is becoming more and more assured and they are now a vital part of the economic life of the regions which use their resources.

#### THE VALUE OF FORESTS IN MODERN WARFARE.

A few words on the part that the forests and the United States Forest Service are playing in the present war and then we shall come down to forestry in Hawaii.

In this age of coal and iron, wood and other forest products which have almost innumerable uses in modern warfare are being sought more eagerly and used more extensively than ever before. In the trenches, on the road, in the air, in the shipyard, in the munition factory and chemical laboratory and in the building of cantonments, wood has become a dominant factor and never before has the demand for exact knowledge on the quality and uses of wood been so urgent.

In modern warfare forest products are needed in large quantities. The average trench requires alone about one cubic foot of wood to 10 feet of trench or about 60,000 board feet to the mile or 15 billion feet to the French front exclusive of that required for shelter, artillery screens, block houses and fuel.

Forest industries which were on the decline or entirely abandoned have been revived by the war and new uses for wood products developed.

Wooden ships and airplanes call for special materials. Sitka spruce, once a despised material, is now found almost indispensable for airplane construction furnishing long, clear, light, yet strong material in which failure is far less common than in the metal parts. In fact, the demand for spruce wood is now so great that a spruce-production division of the Signal Corps has been formed of 10,000 men to get this needed commodity from the woods to the airplane factories.

About 200 board feet of wood is used in the actual construction of the average airplane. To obtain this material it is ordinarily necessary to work over about 1500 feet of select lumber



which often represents all that can be used for airplanes of 15,000 board feet of standing timber.

#### FORESTERS IN WAR WORK.

The forest products laboratory of the Forest Service at Madison, Wisconsin, has been of the greatest assistance to the War Department in solving many of the problems which have arisen from the increased use of wood, especially in connection with its seasoning for aircraft material and much assistance has also been given to hardwood distillation plants in order to increase the production of acetone and other products needed for munition making.

A forest school classmate of mine, who is now Assistant Director of this laboratory, recently wrote me as follows:

"The Laboratory seems to have the confidence of the War Department and problem after problem having to do with wood is being referred here. Our force has been increased 100 per cent. Practically all work is war work. We are working at high tension; some of the sections are working double shifts because we can't turn out the work as fast as it is referred to us. While the desire to get into one of the Forest Regiments was strong within me, I am getting some mental compensation out of the fact that I am engaged here wholly on work of a national defense character."

Of men, the Forest Service and the lumber industry have contributed thousands who have been over in France now for some time helping the Allies in cutting and getting out timber, lumber, and other material for the use of the armies and in building railroads, roads and bridges.

Forester Graves was one of the first to go over to make arrangements for this work and has recently been promoted to the rank of Lieutenant Colonel. He was soon followed by the first regiment of woodsmen numbering about 1200 men and designated as the Tenth Engineers (Forest). Over 300 qualified foresters and lumbermen have been commissioned to serve as officers for these forest battalions and of these two-thirds are practical lumbermen or saw-mill operators and one-third are trained foresters with long woods experience. The second regiment called the Twentieth is now being formed and will be the biggest regiment in the world.

#### II. FORESTRY IN HAWAII.

It is a far cry from the battle front to the mountains of Hawaii, but it is here that are found the forests, which conserve the water, which irrigates the cane, which produces the sugar, which goes to feed the armies over seas and the many people contributing to their support.





NATIVE HAWAIIAN FOREST AT MOKULEIA, OAHU.  
Kukui type in foreground, ohia lehua type in background.

## EXTENT OF THE ORIGINAL FORESTS.

Originally the Hawaiian forests were limited no doubt only by such natural conditions as lack of rainfall, elevation, and lava flows. The extent of the original native forest is not known, but that it was much greater than at present is certain from the scant evidence that remains. Shells of land molluscs found on Niihau in a subfossil state indicate a once heavy forest and considerable moisture on that island. The forests on Kauai came much further down than they do at present and on Oahu the Leilehua plateau between the Waianae and Koolau ranges was no doubt once densely forested. The few insects, peculiar to boggy uplands, found on the higher forest region on Lanai indicate that there was once a boggy region similar to the wettest part of Molokai. On Molokai and Lanai there was evidently a considerable growth in the early days of koaia and koa on the lower slopes below the elevation of 2000 feet, but these have been killed out entirely on Lanai and only a few scattered koa trees remain on Molokai outside the limits of the true forest.

Even in the region on the dry lower slopes of the leeward side of the islands, where the algaroba is now predominant, there was once more or less open forest land, for Perkins tells us that passerine birds regularly descended into the clumps of trees of this open country and from there even, in Cook's time, they passed still downwards and several species were found frequenting the coconut tree on the beach.

## PRESENT FOREST AREA.

The present area of original forest lands in Hawaii through various agencies has been reduced until now it covers approximately only 800,000 acres or 20% of the total land area, two-thirds of which is under government control.

This record of forest destruction is beaten only in countries or islands of very dense population such as Porto Rico, for instance, which was once completely forested but on which the virgin forest area has been so materially modified by the acts of man and beast during several centuries that it is now reduced to only 2 per cent of the total land area.

The destruction of the Hawaiian forest in the past was deplorable, but that it should continue in the present for one reason or another seems inexcusable.

## FOREST TYPES IN HAWAII.

As we find them today, what remains of the Hawaiian forests together with the forest of introduced trees, may be divided for the purpose of convenience in forest management into forest types. Technical botanists have classed the Hawaiian flora into different groups or zones based on physical features mostly of elevation. Hillebrand gives us five of such zones; the lowland,



lower forest, middle forest, upper forest and the bog zone, and Rock has added to these one more, the strand type or zone.

In the following classification the bog zone is omitted altogether since it cannot be considered a forest type on account of the general absence of trees, and the several types are named, as is customary, after the most striking tree which is characteristic of the region. This classification is admittedly rough and several species such as the ohia and naio which occur from sea level up to 7000 feet will be found in one or more types and in places the key tree may sometimes be lacking. But these types will readily be recognized in the field and will serve the general purpose of the forester.

For convenience in forest management then, we have the following four main forest types:

### 1. ALGAROBA TYPE, *Prosopis juliflora*.

This corresponds more or less to the lowland type of the botanist, and in it the introduced algaroba is now the predominant tree in most regions and particularly on the leeward side of the islands. In it are also found the hau, hala, and prickly pear and, near the shore, the kamani, milo and coconut. This type is usually found from sea level up to 1000 feet.

### 2. KUKUI TYPE, *Aleurites moluccana*.

This corresponds in situation to the lower forest type of the botanist, and in it the kukui strikes the eye as being the predominant tree in most situations, more especially in valleys and lower slopes.

On the windward side of the island the trees in this type constitute a wetter forest than on the leeward side and often koa occurs in it and ohia ai, and shrubs such as ki, ape and ginger and the ieie vine.

On the leeward side where more xerophytic conditions occur, the kukui is confined more closely to the moisture gulches and we find in addition a great wealth of dryland trees among which the ohe, wiliwili, halapepe, and olopua are leading species. In fact, it is in this type on the leeward side of the island that, according to Rock, 60% of all the species of our indigenous trees are found. It is interesting to note that with the exception of four or five trees, such as the wiliwili, which have light, soft wood, and thin bark, all of the trees in this type in the drier situations, have hard, close-grained wood and thick bark. This type is found between the elevations of about 1000 feet to 2000 feet.

### 3. OHIA LEHUA TYPE, *Metrosideros collina polymorpha*.

This corresponds to the middle forest zone of the botanist and constituting our "rain" or water-producing forest is consequently the most important type. Ohia lehua attracts the eye as the most predominant tree although almost pure stands of koa and a variety of other trees may be found in it. This type is found usually between the elevations of 2000 to 5000 feet.

#### 4. MAMANI TYPE, *Sophora chrysophylla*.

This type occurs above the ohia lehua type but only on the islands possessing the higher elevations of from 5000 to 10,000 feet. It corresponds to the upper forest zone of the botanist and in it may be found almost pure rather open stands of mamani with also some naio and occasionally koa and ohia.

#### VALUE OF THE FOREST TYPES.

From the viewpoint of forest management, the value of these four types may be described as follows:

1. ALGAROBA TYPE. A commercial or supply forest useful mainly for the production of algaroba wood, and beans for stock feed, and blossoms for bee pasturage. In this type other introduced trees may also be grown for fuel and timber.
2. KUKUI TYPE. A protection forest, valuable chiefly in the scheme of water conservation as a protection to the ohia lehua type immediately above and also for the production of wood in its lower parts.
3. OHIA LEHUA TYPE. An absolute protection forest, because generally it is water producing and therefore the most important. It should be left strictly alone without interference by man or beast.
4. MAMANI TYPE. A protection forest, valuable chiefly for its protective influence on the ohia lehua type immediately below. In a minor way it may some day be considered in parts a supply forest for the production of planted commercial timber.

#### CHIEF VALUE OF THE HAWAIIAN FOREST.

It may readily be seen from the foregoing classification that the prime value of the main Hawaiian forest types lies not in their commercial wood products but in their ability to serve as a protection to the watersheds of streams and springs needed for irrigation and domestic purposes and to watersheds tributary to artesian basins and in their beneficial forest influences in regions where the people depend mainly upon the rainfall for their water supply.

That these forests are intimately connected with the leading industry in the islands—sugar production—through the water which they conserve, may readily be seen from the fact that of the total of 649,786 tons of sugar produced in the 1917 crop on an aggregate area of 120,251 acres, 62% of the tonnage was secured from irrigated fields covering 62,979 acres. In addition to actual irrigation, these forests supplied water for domestic purposes, for the development of electrical energy for pumping and, in the unirrigated regions, water for fluming cane.

#### FOREST PROTECTION THE CHIEF WORK.

The chief value of the forest in the last three types, therefore, is the effect which it has on the supply of water, and the industries of the Territory demand that it be managed chiefly as a

protection forest. Forestry in Hawaii therefore is chiefly concerned with forest protection.

The feasibility of treating the native forest on the leeward side of the island of Hawaii, where there are no permanently running streams, as a supply or commercial forest, has been advocated and attempts have been made to utilize the mature timber in these forests by manufacturing it into ties and lumber and placing it on the market. That these attempts have resulted in failure is in my opinion fortunate, for although the plan of exploiting this forest included a scheme for immediate reforestation after logging so as to keep a forest on the land, I believe that our knowledge of the treatment of this forest so as to insure a second crop either naturally or artificially is as yet so imperfect, that it is far safer to preserve it in its original form.

The practice of forestry in the three main types of forest should therefore continue to be forest protection. Forest planting for the production of fuel wood and timber in the lower part of the kukui type, as well as in the algaroba type, is proper, has been going on for some time, and may be continued on selected areas without detriment to the main purpose of this type, provided the land is continually kept in forest by coppice growth or by replanting immediately following cutting. Forest planting also for the production of lumber may be done in the mamani type provided this same course is followed.

#### HISTORY OF FOREST DESTRUCTION.

But continued efforts must be made in the work of forest protection to prevent the further destruction of deleterious agencies which have wrought havoc in the native forest in the past and to build up the forest and restore it to a condition of greatest usefulness.

These destructive agencies probably began with the sandalwood trade when the woods were stripped of this valued tree but the first serious damage began as far back as 1815 when cattle became so abundant that they penetrated the accessible forests and gradually worked their way year by year further back into the native jungle.

The susceptibility of the Hawaiian forest to injury by cattle is too well known to need description here. The combination of trees, undergrowth, vines and ferns is ideal for the conservation of water, but this combination is not able to stand up against the onslaughts of cattle grazing. You must have either the indigenous forest intact or allow cattle in the forest until it dwindles down finally to nothing but a waste of dead trees and Hilo grass producing no steady supply of water.

Goats have also done their share in this forest destruction. Insects have attacked the trees in their weakened condition, introduced grasses have been spread by stock and have prevented the forest from renewing itself by natural reproduction and what damage has not been done by these agencies, has been accom-





FUEL WOOD CUT IN THE ALGAROA TYPE, LUALUALEI, OAHU.





plished by destructive fires which have followed long dry spells and by man who has drawn upon the native forest for his firewood. All of these have worked tooth and nail until it is a wonder that we have left a forest of any value.

#### GRAZING MOST DETRIMENTAL TO NATIVE FOREST.

The continued grazing of cattle today in the native forest for the pecuniary benefit of a few to the detriment of the future welfare of the chief industry of the islands and of the community is very short-sighted. If this one element of damage were removed once and forever, a great deal will have been accomplished for forest protection in Hawaii. Much good work along this line has of course been done, but as a rule it has not been started until the shoe has begun to pinch, until the scarcity of water for fluming or other purposes has made it imperative that the remaining local forest be protected. With the cattle excluded from the forest once and for all by proper stock-proof fences, appropriate steps could then be taken toward getting the forest back into a satisfactory normal condition for water conservation by a careful study and solution of the problems which confront us.

#### PROTECTION OF CITY WATERSHEDS.

Right here I wish to digress to the subject of the protection of city watersheds by excluding not only cattle and other stock but also human beings. This is a practice, the necessity of which is becoming more apparent on the mainland, but when in 1916 a rule which forbid trespassing on the Honolulu watershed in Nuuanu Valley was passed by the Board of Agriculture and Forestry various protests were then and have continued to be voiced by those who place their own personal pleasure above the health of the community and sanitation of the city.

The city of Portland, Oregon, enjoys a continued abundance of the purest mountain water in the world, and this is assured only by the absolute forbidding of all trespassing on the Bull Run watershed which was set aside by act of congress in 1892. This comprises an area of 18 miles by 22 miles, in extent, containing 142,080 acres, or little smaller than the combined areas of Lanai and Niihau.

It will probably be advisable in the near future to place other watersheds in the Territory under a similar rule and for the same purpose.

#### FOREST DETERIORATION DUE TO OTHER CAUSES.

Another phase of the deterioration of the native forest has recently been discussed and this involves changes in soil conditions. It has been asserted that our present flora is a new-soil flora which is not able to persist on old soils; that our native forests are doomed and are dying out so rapidly that within 50 years or more they will have no value whatsoever as protective

coverings for our watersheds; and that the only solution is to replace the native flora by introducing new plants.

Personally, I cannot take such a gloomy view of the situation but feel confident that when given adequate protection from further injury by man and beast, the native forest in most regions will in large measure come back of itself, although it may be advisable to supplement the process with introduced species, carefully suited to the situation by adequate tests.

On the mainland in the eastern states the chestnut blight has within the past few years wiped out practically all of the chestnut trees. In the west it has been asserted that the dendroctonus beetle does as much damage annually to the pine trees as do forest fires, but other trees take their places and a satisfactory forest is still there.

To me it seems foolish to predict the extinction of the native forest in such a brief space of time as 50 years. It is well known that the flora of the islands as a whole contains a much larger proportion of endemic plants than that of any other country of the same size and that the richness in endemic species stands in the same ratio as the age progression of the various islands which is from east to west. The flora of Mauna Loa on the newest land, which indeed is still in the process of formation, is the poorest and most uniform, while Kauai, the oldest island geologically, is not only the richest in species but also has them on the whole more differentiated.

Volcanic activity in the Waianae Range on Oahu according to Doctor Sereno Bishop ceased at least 700,000 years ago and from evidence of extinct Eocene fossils found in the elevated coral reefs, this volcanic extinction probably occurred much earlier, since the dawn of Eocene time is placed by geologists at four million years ago. It is reasonable to assume, therefore, that Kauai, which is older than Oahu, had forest growth on it at least half a million years ago. If our native forest belongs to a new-soil flora and is unsuccessfully trying to persist on old soils, and soil conditions are changing so rapidly on Maui, for example, that aside from injuries done by man and beast, in 50 years there will be no native forest left, it appears to be rather remarkable that we still find any forest at all remaining on the much older soils of Kauai.

From evidence in the wet forest region of Molokai and other places where the native growth has come back wonderfully as a result of complete protection against stock, I believe that the balance of native forests if given this complete protection will continue to serve their purpose as water conservers for many many years after we and our descendants have been forgotten.

#### FOREST PROTECTION MUST BE SUPPLEMENTED.

The problem of getting the native forest back to normal, however, is not simply a matter of protection against damage. It

involves other features on which a great deal of experimentation must take place before the cheapest and most satisfactory methods are determined.

#### GETTING RID OF THE HILO GRASS IN THE FOREST.

One of these problems is getting rid of Hilo grass which has followed cattle grazing into the forest and which prevents natural reproduction of our native forest trees. Not only cattle but pedestrians have been responsible for carrying the seed of this forest pest into the innermost sections of the Hawaiian woods. There is hardly a foot of the trail from the Waiahole tunnel over the Koolau Range to Waiawa Valley which does not now contain Hilo grass which has sprouted from seed carried on the shoes and trousers of those who have walked over the trail. It may become advisable in the future to stop all travel in the native forest to prevent this one thing alone.

In order to get rid of the vast stretches of Hilo grass now found on the borders of or within the native forest, as a preliminary to reforestation, it will likely be necessary to expend considerable money. What seems now to be the most feasible method of accomplishing this is one which is in vogue in the Philippines where over 40% of the area of the islands is covered with cogon grass which is not only useless for grazing and destroys the productivity of the soil in which it grows, but is a fire menace and, worst of all, is the breeding place of the destructive locusts which yearly swarm over the islands. This method is to burn the cogon grass just before the rainy season and broadcast the seed of the Ipil ipil, *Leucaena glauca*, which is also common in these islands where it is known as haole or false koa. It has been found that this small tree will not only kill out the cogon grass within two years, but increase the value of the soil by the fixation of nitrogen and remedy the toxic effects produced by cogon so that reforestation may proceed. No doubt many Hilo grass areas in Hawaii could well be reclaimed by a similar method.

#### TREE INTRODUCTION.

The introduction and dissemination of exotic trees, shrubs, vines, and other plants to supplement our native flora must evidently be done in the most careful manner so as to avoid the establishment of any new pest such as the lantana. The introduction of the different species of banyan of the genus *ficus* has been advocated, but it has not yet been proved that they are entirely suitable for our wet forest region. It is questionable whether the desired lower story of bushes, ferns, and undergrowth will come up under their dense shade and if their natural spread is facilitated and hastened by the introduction of a flower-pollinating wasp, it is not certain that they will not become a pest in localities where they are not wanted.



## PRECAUTION SHOULD BE EXERCISED.

It is imperative, therefore, that the greatest of care be exercised in the work of plant introduction for the replenishment of the native forest. A few successful and proper introductions will be much more valuable than a heterogeneous accumulation of plant pests. The Division of Forestry has been working along this line and has done what it could with its limited facilities but is yet not prepared to announce with confidence many tree introductions which are absolutely reliable for this purpose.

## OTHER PHASES OF FORESTRY.

Other phases of forestry in Hawaii could be mentioned, if time permitted. Among these is the treatment of the algaroba forest which is susceptible of true forest management on a regular rotation. The work of thinning the algaroba to increase the yield of pods and bee pasturage is true forestry and much more along these lines could readily be accomplished. The work of planting trees for the production of fuel wood and timber which is now carried on at the rate of about 1,000,000 trees annually, largely by private interests, is true forestry which produces comparatively early returns.

## PRESENT STATUS OF FORESTRY IN HAWAII.

The history of government forest work in Hawaii is familiar to most of you. Except for some introduction and tree planting work which was performed by the government previous to 1903, and the protection of certain forest areas by private owners, the real forestry movement began with the creation of the Division of Forestry under the Board of Agriculture and Forestry. The principal work of this Division in the past has been the demarcation and setting apart of forest reserves and the raising and distribution of trees for planting. The first has almost been completed so that now there are 39 reserves having a total area of about 772,000 acres of which 68% or over half a million acres is government land.

## THE FOREST RESERVES.

According to the forest axiom that all land should be put to its highest use, the boundaries of these reserves have been drawn so as not to interfere with revenue-producing land or areas which may be developed for agriculture except where stream protection and forest influence are unquestionably more important. In other words, the present forest reserve land is confined as closely as possible to areas which are not suitable for any greater economic use. It would have been better had the reserves originally included more land so as to secure the protective benefit of woodland belts above and below them. To make appreciable reduc-



SLOPE DENUDED OF FOREST BY CATTLE AT MOKULEIA, OAHU.  
Heavy native forest in background protected from the ravages of  
stock by a steep gulch.



tions in any of the forest reserve areas on the plea of increased stock production or on other grounds, would be disastrous to the main purpose for which they were created. Where adjacent private lands are involved in these reserves, the proclamation creating reserve applies to them only in the nature of a recommendation that such private lands be protected and held by the owner as a forest reserve. In some cases, such lands have under the law been turned over to the care and control of the Division of Forestry. In others, the owner has given them adequate protection. In still other cases, the opposite has unfortunately been true.

#### FOREST RESERVE ADMINISTRATION.

Of recent years, an attempt has been made with the available facilities to take these reserves out of the class of "paper reserves" and to place them under true forest administration and protection. On almost 50 miles of reserve boundaries fences have been built or repaired where it was necessary to keep stock from the native woods. The Division of Forestry is always ready to meet the adjacent owners half way in the cost of co-operative fences. A comprehensive regulation against trespass on the reserves has been passed and is enforced along with other regular work of fence building and repairing, tree planting, and patrolling for forest fires in the dry season, by six forest rangers who are constantly on duty so that each main island now has at least one forest ranger to look out for the government's interests in the reserves.

#### WATERSHED PLANTING.

In reforestation, special attention has been given to the planting up of watershed areas. Upper Nuuanu received early treatment and more recently the government reserve lands in Manoa and the Makiki Valleys have been reforested with native species, mostly koa and kukui, with great success.

#### CONCLUSION.

In the Territory of Hawaii public sentiment is fortunately favorable on the whole to forestry with good reason. It remains to give this sentiment still further substantiation by fortifying the efforts of the Territorial Government in protecting and bringing back to normal on private as well as on government lands the forest which conserves and maintains the agricultural life blood of the land. To do this, concerted action is necessary and is confidently expected.



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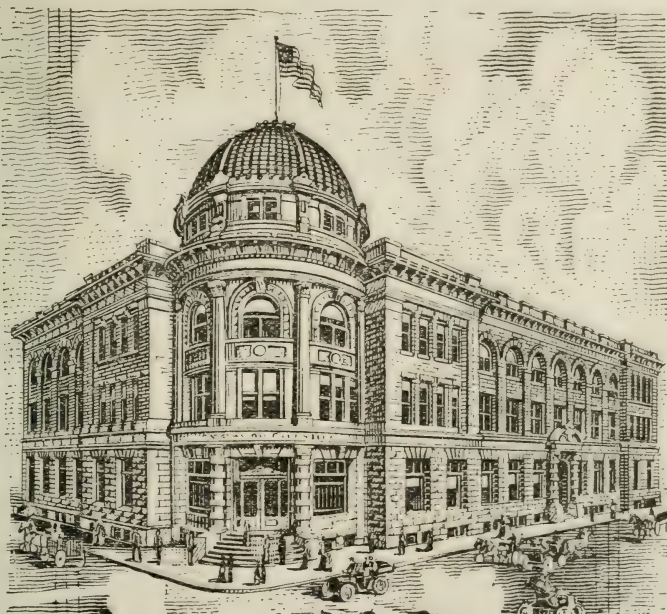
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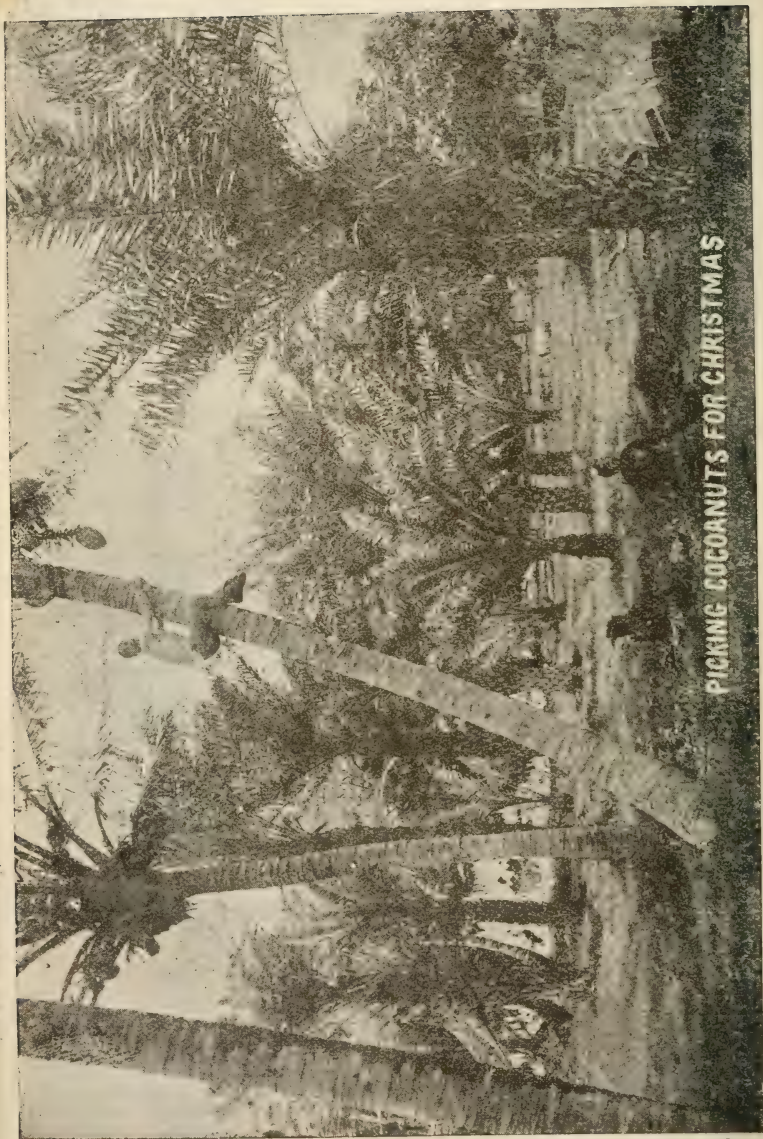
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

JUNE, 1918

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## THE ANNUAL REPORTS.

The annual reports of the Superintendents, printed in the current issue, set forth the activities of the five Divisions during the calendar year 1917. The Division of Forestry has continued its two main lines of work—forest protection and forest extension. Fence building and repairing, the extermination of wild cattle from the native forest, the suppression of forest fires, the examination and survey of government forest lands for inclusion in new reserves, and protection against trespass by a force of six forest rangers have constituted the main work of forest protection. Forest extension has been aided by the distribution from government nurseries of over 350,000 tree seedlings for general planting, and during the year a total of over 850,000 trees was planted throughout the Territory. The Division has confined its own planting almost exclusively to watershed areas and set out approximately 25,000 trees, mainly koa, on the open lands of the Honolulu Watershed forest reserve in Manoa and Makiki valleys.

The Entomologist has done good work in the rearing of beneficial insects and during the year distributed a total of 240,082 to combat crop pests throughout the Islands. The work of Plant Inspection has been strengthened and facilitated by new quarters and equipment of modern construction near the waterfront. These were first occupied during the last month of the year.

Excellent work was done by the Territorial Veterinarian and his assistants in controlling and suppressing the outbreak of anthrax, new to the Territory, which occurred first in April on Kauai, and later on Oahu and Maui. By the prompt disposal of carcasses, isolation of exposed stock, and by vaccination, the losses were confined to a minimum, the disease stamped out, and the Island herds saved for the local beef supply. Progress was made in the eradication of bovine tuberculosis and this was materially aided by the compensation act passed in the last regular session of the legislature. Aside from these two diseases, the live stock of the Territory has been singularly free from infectious diseases during the year.

The Marketing Division, transferred to this Board on July 1, 1917, has continued to serve its useful purpose of finding a market for the produce of small farmers, old accounts have been

straightened out, and the Division put on a businesslike basis by the successful installation of a new system of books.

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The revised regulations of the Division of Animal Industry governing the importation of live stock into the Territory, appearing in this issue, conform with the federal regulations now in force and bring up to date the regulations of the Division on this subject which are still in effect with the addition of an enlargement of the rule pertaining to the introduction of cattle for dairy and breeding purposes in order to prevent the establishment of new centers of bovine tuberculosis infection.

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The new plant inspection rules recently adopted by the Board and approved by the Governor on June 8, which appear in this issue, are for the purpose of strengthening the plant inspection system and making the Territory safer against the introduction of new insect pests and plant diseases.

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The Governor's notice, printed in this issue, calls for a public hearing at the office of the Board on Wednesday, June 19, at 9 o'clock a. m., to consider the setting apart of new forest reserves on Kauai, Oahu, Maui, and Hawaii, and of the elimination of small areas on Oahu for the purpose of exchanges for road construction. These new reserves total 1758 acres, and with the inclusion of several thousand acres in other new reserves, now in the course of preparation, the demarcation of the general forest reserve system throughout the Territory will be completed.

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Rules III and IV of the Division of Forestry have been more firmly established by the arrest and conviction of violators, the announcement of which is made in the April report of the Superintendent of Forestry printed in this issue.

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The First Territorial Fair, held at Kapiolani Park, Honolulu, on June 10 to 15, has exceeded all expectations in its quality and magnitude, and has been a very fine thing in bringing together live stock and agricultural products for the purpose of comparison and the stimulation of friendly rivalry in future production.

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During the recent special session of the Territorial Legislature provision was made for the payment of back bills amounting to \$1757.11, incurred in suppressing the anthrax outbreaks, and for the transfer on July 1, 1918, of the Marketing Division to a new commission to be appointed by the Governor.

# Division of Forestry

## ANNUAL REPORT.

Honolulu, June 3, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I have the honor to submit the following brief report covering the work of the Division of Forestry for the calendar year 1917:

### INTRODUCTION.

The main activities of this Division have continued to be forest protection and forest extension. Under the first subject there has been considerable expansion, and much progress has been made in placing the forest reserves under better administration. In the work of forest extension, the Division has continued to raise and distribute tree seedlings at cost for general planting throughout the Territory, and in the tree-planting scheme of the Division particular attention has been given to the reforestation of water-producing areas.

### FOREST PROTECTION.

*Forest Fencing.* The general program of fencing boundaries of government forest reserve lands exposed to stock has been continued although not so extensively as had been planned owing to the session of the Legislature and the anthrax epidemic, which required my personal attention for more than half of the year. In coöperation with the Kukaiau Ranch Company, a start was made on the construction of over six miles of fencing required to keep stock out of the northwest corner of the Hilo forest reserve, Hawaii, by the building during the last half of the year of 2.78 miles of fence. Under a general lease requirement 1.35 miles of fence were built on the boundary of the Nanakuli forest reserve, Oahu, and at Hauula, on the same island, 0.63 mile of fence was constructed by homesteaders under an agreement made by the Land Commissioner on the boundary of the proposed reserve in that region. Other shorter stretches of fence constructed on Oahu and Hawaii brought the total of new fences built during the year up to 5.32 miles. This, with the 0.37 mile of fence repaired on the Honolulu Watershed reserve boundary, constituted a total of 5.69 miles of forest reserve boundary made stock-proof during the year.

*Administration.* The six forest rangers now working on the several islands are doing good work in caring for the interests of the forest reserves by enforcing the rules of the Board, patrol-



ling for fire, preventing trespass, repairing and bullding fences and planting trees. On August 1, Mr. Hosea K. Lovell succeeded his father, Kaina D. Lovell, who died on June 20, as forest ranger for windward Kauai, and as forest ranger for Hawaii Mr. A. J. W. Mackenzie on October 1 succeeded Mr. F. B. Dodge, who resigned on June 20 to enter the U. S. Navy.

In conjunction with the fence construction in the Hilo forest reserve, mentioned above, a special effort has been made during the year to rid the government forest lands of Piha and Laupahoehoe of wild cattle. Under hunting permits issued to Mr. H. Meyer and the manager of the Kukaiau Ranch and his employees, over 30 head have been eradicated either by roping or shooting from this region during the year.

A further effort was made during the last part of the year to rid the Island of Kahoolawe of goats by terminating the rights and privileges which Mr. Eben P. Low may have had on the island and by giving a permit to Mr. James C. Crane to remove the goats from the island.

Many other permits for goat-hunting and other privileges, consistent with the main purposes for which the reserves were set aside, were issued under Rule II during the year.

*Forest Fires.* In spite of a very dry summer season during the year there fortunately were only a few forest fires, none of which did any extensive damage. The first occurred on June 25 on the Koolau Range side of the military reservation in Waianae-uka, Oahu, and was extinguished the same day by two troops of the Fourth Cavalry and ninety prisoners from a German warship. About 50 acres of mostly grass land were burned over. In August a small grass fire at Maili, on the Leilehua plateau, Oahu, was extinguished the same day it started. During the same month the menace of homesteaders' clearing fires and the dry condition of the woods at Laupahoehoe, Hawaii, made it advisable to appoint Mr. H. S. Rickard as assistant fire warden, and he rendered valuable services in preventing many small forest fires in this region. During August a fire broke out in the Piihonua woods, Hawaii, but was soon put under control by employees of neighboring plantations working under Fire Warden John A. Scott. An area of about 50 acres was burned over. The last fire, which occurred on September 16, burned over 10 acres of waste brush land at Waikapu, Maui, before it was extinguished by a fire warden and his assistants.

*New Forest Reserves.* During the year one new reserve was set aside by proclamation of the Governor on April 11, 1917. This was the Panaewa forest reserve, in the land of Waiakea, district of South Hilo, Hawaii, and consisted of 1750 acres of forest land. This brought the total area of land in forest reserves up to 800,094 acres, of which 68.5 per cent, or over half a million acres, is owned by the Territory. Much work was also done during the year in accomplishing the surveying and other field work necessary for the setting apart of additional acres.

The following four projects—the Keauohana reserve on Hawaii, the addition to the Makawao reserve on Maui, the Waiahole reserve on Oahu, and the Papapaholahola Spring reserve on Kauai—have already received your approval and are now in the hands of the Governor for public hearing preliminary to the issuance of proclamation, and the following five new projects are almost ready for your consideration: the Hauula, Mokuleia, and addition to Makua-Keaau reserves on Oahu, and the Nonou and addition to the Na Pali-Kona reserves on Kauai. These will about complete the work of setting apart forest reserves in the Territory.

#### FOREST EXTENSION.

*Tree Distribution.* During the year there was raised at the four government nurseries and distributed for general planting throughout the Territory a total of 353,527 tree seedlings. Of this amount, 80 per cent was received by sugar plantation and ranch companies interested in tree planting. On Arbor Day a total of 12,111 trees was distributed for planting on this occasion, which fell this year on November 16.

*Tree Planting.* Reports received from tree planters throughout the Territory, which, however, are probably not complete, show that during the year in all 851,053 trees were planted out on the several main islands. This is well above the average number planted annually during the past ten years. One-half of the trees were set out for the purpose of watershed protection and 85 per cent was planted by sugar plantation companies. On account of the importance of a forest cover on water-producing areas the Division of Forestry has concentrated its tree planting on such areas and has continued reforestation work on Kauai and Oahu by the planting out of almost 25,000 trees, mainly koa, during the year, with the result that the planting up of vacant government land on the Honolulu Watershed forest reserve in Manoa and Makiki valleys is about completed.

The work of planting a few trees of many different species on the Manoa ranger station to test their value for different purposes was completed during the year, and in time much useful information will be available as a result of this experimental planting. The successful planting of Jeffrey pine on the slopes of Haleakala assures the possibility of producing timber trees of commercial value at the higher elevations of this island group. During the year 2000 Australian red cedar trees were planted out in different situations throughout the Territory. This is a new introduction which already gives promise of being of value, since a 15-months-old tree on the Manoa ranger station has already grown 11 feet in height. On Tantalus, at an elevation of over 1200 feet, 20 different species of important timber trees of the Philippines, brought to the Territory by Mr. J. F. Rock, were planted out so as to be producers of seed for general distribution.

The Division of Forestry has been of service to a great many people interested in tree planting by giving advice and directions for tree planting and by supplying seedlings. It has also had general direction of the planting of street trees on the new Dowsett Tract in Nuuanu Valley, and has assisted in the planting scheme for the Honolulu Country Club in the same valley.

#### MISCELLANEOUS.

In carrying out the provisions of Rule IV of this Division, which was approved by the Governor on July 28, 1917, and which provides for the protection of bird, animal, and vegetable life on seven small islands off the shores mainly of Oahu, signs have been placed on some of the islands and a special honorary forest ranger has been appointed to enforce the rule.

During September, Botanical Bulletin No. 4, "The Ohia Lehua Trees of Hawaii," a revision of the genus *Metrosideros* by Consulting Botanist J. F. Rock, was published and distributed.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry and Chief Fire Warden.

#### REPORT FOR APRIL.

Honolulu, May 17, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of April, 1918:

#### TREE PLANTING.

During the month the planting crews on the Honolulu Watershed forest reserve have been engaged almost entirely in cleaning up the heavy growth of weeds and grass which has come up around the trees planted in Manoa and the Makiki valleys as a result of the recent heavy rains.

On the Kealia forest reserve, Kauai, Ranger Lovell planted out 150 silk oak trees.

All of the replies from tree planters throughout the Territory have been received and these show that during the calendar year 1917, 851,053 trees were set out on the various islands, as follows:

Maui .....	458,348
Oahu .....	154,911
Hawaii .....	125,163
Kauai .....	110,669
Lanai .....	1,912
Molokai .....	50
Total .....	851,053



This is slightly less than during the previous two years, when the trees planted totaled 878,328 in 1915 and 925,400 in 1916.

A quantity of seed of the gum arabic tree, *Acacia arabica*, is being secured and seedlings will be raised for experimental planting in the forest reserve on the dry west slope of the Waianae mountains. This is a tree which readily reproduces itself from seed and root-shoots and will do well on dry, impoverished soil. The wood is excellent for fuel and is very suitable for posts and ties on account of its durability. Seed of the khair, *Acacia catechu*, another valuable tree of India, has also been secured locally and seedlings will be raised and planted at the same place.

#### FOREST FENCING.

The forest fence at Piha, in the Hilo forest reserve, Hawaii, where the work has been delayed by the heavy rains, is nearing completion and will now be finished probably by the middle of May. The total length of the new fences in this region which have recently been built in coöperation with the Kukaiau Ranch to keep cattle from getting onto government lands in this reserve is 6.20 miles.

A visit to Hauula, Oahu, on April 5, disclosed the fact that 0.63 mile of fence had been built by the homesteaders on the new forest reserve boundary under the understanding made by the former Land Commissioner, and a promise was secured from them that the remaining 0.25 mile of fence would be completed at the earliest practicable date.

For repairing the fence along the Waimea side of the Pupukea forest reserve, Oahu, in coöperation with the ranch department of the O. R. & L. Co., 12 coils of wire and 20 pounds of staples were supplied by this Division on April 18.

In the new lease of the upper grazing land of Piihonua, Hawaii, above the mauka boundary of the Hilo forest reserve, which was recently sold to Mr. W. H. Shipman, the Commissioner of Public Lands, at the suggestion of this office, included the following clauses for the protection of forest interests in this region:

"Unless otherwise directed by the Commissioner of Public Lands, the lessee shall, at his own cost and expense, maintain during the term of this lease in good stock-proof condition the present fence along the eastern boundary of the land, herein demised, shall make every endeavor to keep stock from getting through such fence onto the land to the east of such fence, and shall remove or exterminate at once any stock which may get through such fence onto the land to the east of said fence.

"If any land is withdrawn from this lease for the public purpose of forest protection along the eastern boundary of the land, herein demised, the rent shall be reduced on a basis which, in the opinion of the Commissioner of Public Lands, is equitable, and the lessee shall within one year from the date of such with-



drawal at his own cost and expense construct a stock-proof legal fence, which is satisfactory to the Superintendent of Forestry, along the western boundary of such withdrawn land, shall maintain such fence during the remainder of the term of this lease in good stock-proof condition, shall make every endeavor to keep stock from getting through such fence onto the land so withdrawn and shall remove or exterminate at once any stock which may get through such fence onto the land so withdrawn."

#### FOREST RESERVE WITHDRAWALS.

After a public hearing held on April 4, at which the matter was fully discussed, the Governor on April 20 signed a proclamation withdrawing the Island of Kahoolawe from the forest reserve. The reasons for this action were, briefly, as follows: The island is not water-producing and it would be foolish to waste money in the almost impossible task of trying to reforest the bare top of the island; the algaroba is now satisfactorily established on the rest of the island; although approximately 5000 goats have been exterminated on the island during the past eight years, it has been difficult to induce anyone to eradicate the remainder; this can be accomplished by turning the island back to the Land Commissioner, who only can make a lease which will allow someone to fatten a limited number of cattle on the acres of pili grass and tons of algaroba pods now going to waste on the island and which will require that the goats be completely exterminated within a fixed period of time.

The project of withdrawing three small parcels of land, aggregating 1.76 acres, on Tantalus Heights, from the Honolulu Watershed Forest Reserve, which are desired by the Land Commissioner for use in exchanging land for road purposes, approved by the Board on April 24, was referred to the Governor on the following day for issuing the required notice of public hearing.

#### NEW FOREST RESERVES.

The projects of setting aside the Papapaholahola Spring reserve, Kauai, consisting of 54 acres; the Keauohana reserve, Puna, Hawaii, comprising 271 acres, and the addition of 263 acres to the present Makawao forest reserve, Maui, approved by the Board on January 18, and the project of setting apart the Waiahole forest reserve, Oahu, approved by the Board on April 24, were on April 25 referred to the Governor for consideration and issuance of the notice of public hearing.

During the month field work was done, in coöperation with the Survey Office, in obtaining a description of the proposed new Hauula forest reserve, Oahu, and in marking on the ground the boundary of the proposed new Mokuleia Forest Reserve, on the same island.

## FOREST RESERVE ADMINISTRATION.

During the month temporary permits were issued under Rule II to four responsible parties to hunt unbranded wild cattle, pigs, and goats on unleased government lands within the Na Pali-Kona forest reserve, Kauai, on the stipulation that full use be made of all meat of animals so killed. In this way it is hoped to get rid of all destructive agencies on lands within this forest reserve which have recently come under the jurisdiction of this Board by lease expiration.

## RULE III.

In addition to the arrest made by the police in March on the restricted area in Nuuanu Valley for violation of Rule III of this Division which forbids trespassing on the watershed, another arrest was made in February for the same reason. Each offender was fined \$10 and costs.

## RULE IV.

In March on the information supplied to the police by Honorary Forest Ranger Bruce Cartwright, Jr., thirteen Japanese chauffeurs were arrested for killing rabbits and robbing birds' nests of eggs on Manana (Rabbit Island), off Makapuu Point, Oahu, in violation of Rule IV of this Division. Each offender was given a suspended sentence of 13 months.

## TRESPASS ON UNRESERVED GOVERNMENT LAND.

On April 1, I detected and stopped the cutting of large guava trees on the government land of Waiahole, Oahu, which is within the area of the proposed new Waiahole forest reserve. This was being done by three Japanese who were making charcoal for the market, to the detriment of the adjacent native forest on account of letting the sunlight onto the ground and encouraging the spread of Hilo grass in addition to the undesirable lessening of the forest cover. The matter was at once referred to the Commissioner of Public Lands, who still has jurisdiction over the land, for the prosecution of the offenders.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, April 30, 1918.

Superintendent of Forestry, Honolulu.

Dear Sir:—I herewith submit a report of the work done during the month of April:

## NURSERY.

*Distribution of Plants.*

	Seed Boxes.	Transplant Boxes.	Pot Grown.	Total.
Sold .....	....	...	310	310
Gratis .....	4000	300	1160	5460
	<hr/>	<hr/>	<hr/>	<hr/>
Total .....	4000	300	1470	5770

## COLLECTIONS.

*Government Realizations.*

Collections on account plants sold.....	\$ 3.95
Rent Building Nursery Grounds, February.....	35.00
	<hr/>
Total .....	\$38.95

*Plantation Companies and Other Corporations.*

The distribution of plants under this heading amounted to 1000 transplants. We have received orders for 50,000 seedlings to be delivered about the end of August.

## MAKIKI STATION.

The work at this station has been mostly routine. The road to the station has been repaired and the buildings have also been gone over and repairs made where required. Six hundred feet of  $\frac{3}{4}$ -inch water pipe has been added to the former supply pipe and laid along the Makiki Valley to a natural dam many feet higher than the former one; consequently we are having a much better supply of water for this station.

## HONOLULU WATERSHED PLANTING.

The work done during the month has been clearing off and hoeing. The koa trees planted on the ridges back of the station a few months ago are doing remarkably well.

The mahogany trees which we planted near the station in the Makiki Valley are also looking well. In the bottom of Hering Valley the *Juniperus Australis*, *Juniperus Bermudiana*, *Cupressus Arizona* and *Cryptomeria Japonica* are all growing splendidly.

Owing to the dry season coming on it will be necessary to suspend planting and attend to the trails as a protection against fires.

The area which was infested with the pest *Caesalpinia bonduc* will require to be gone over again and all seedlings and root

shoots dug carefully out. The opu valley has been cleared of this pest and, with the exception of a few seedlings and root shoots that may come up from time to time, the pest is now under control and will not require much more work to eradicate it entirely.

#### ADVICE AND ASSISTANCE.

The writer while on a trip to Waianae for the purpose of judging the school gardens had time to inspect the work of thinning the algaroba forest which is being done by Mr. Gilbert at Nanakuli. The work is being done in a satisfactory manner, and according to agreement.

The writer has been called upon to make visits and otherwise give advice and assistance as follows:

Calls made, 4; advice by telephone, 8; advice by letter, 3; advice given people calling, 6.

The writer has been asked to compile a list of trees suitable for planting on dry and exposed lands on these Islands. For the benefit of those interested in the matter I herewith submit the following list:

#### TREES SUITABLE FOR PLANTING IN DRY AND EXPOSED LOCATIONS ON THE ISLANDS.

The following list is not compiled from botanical books, nor from floras of countries intended principally for the benefit and guidance of the people living in the countries in which the floras are published. The trees listed have been selected from a large number of species growing for many years on the Islands. The writer has been constantly employed in forestry work on the Islands for nearly thirty years, and has studied the species and the conditions under which they have grown.

The list is not complete by any means, and additional species will be added when we have sufficient proof that they can withstand the drought and exposure and are otherwise adapted to the conditions:

*Albizzia lophantha*,  
*Albizzia lebbek*,  
*Pithecolobium dulce* (Inga),  
*Melia azedarach*,  
*Acacia decurrens*,  
*Acacia dealbata*,  
*Acacia catechu*,  
*Enterolobium cyclocarpum*,  
*Cassia siamea*,  
*Eugenia jambolana*,  
*Eucalyptus calophylla*,  
*Eucalyptus corymbosa*,  
*Erythrina monosperma*.

The *Prosopis juliflora* is worthy of special mention for its



great resistance against drought on low lands near the beach on the leeward sides of the islands. Otherwise, the tree is too well known to require further comment here.

*Leucaena glauca*. Although this tree does not attain a large size when full grown, it is a valuable plant for reclaiming barren waste land and is drought resistant to a certain extent. It bears abundance of seed and spreads very rapidly.

The *Schinus molle* is drought resistant, but owing to it being a surface-rooter and easily uprooted during heavy winds, cannot be recommended for exposed places.

A number of trees apparently drought resistant may be found in gardens in and around Honolulu. These, however, as far as the writer is aware, have not been experimented with on open and exposed lands on the Islands. A few of these species are as follows:

*Acacia arabica*,  
*Berrya ammonilla* (valuable timber tree),  
*Pterocarpus indica*,  
*Afzelia bijuga*,  
*Celtis occidentalis*,  
*Guazuma tomentosa*,  
*Dalbergia sessoo*,  
*Caesalpinia coriaria*,  
*Caesalpinia sappan*.

In addition to the above lists a large number of species can be found in Honolulu represented in many cases by only one or two specimens.

For the purpose of saving what we have, the writer would suggest that the matter of propagating a limited number of each species be commenced with the idea of distributing the plants to people interested, or, better still, set apart a portion of some nearly forest reserve for the purpose of experimenting with those species not found outside of gardens in Honolulu. By doing this we have the advantage of propagating from trees more or less acclimated.

Respectfully submitted,

DAVID HAUGHS,  
 Forest Nurseryman.

### REFORESTATION PROJECT.

Plan for Reforestation in Forest Reserves, Waianae District, Oahu. Approved by the Board June 6, 1918.

Honolulu, June 3, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—The gang of five Hawaiian tree planters employed by this Division completed on May 24 the planting up of

all open government land in Manoa Valley within the Honolulu Watershed forest reserve, Oahu. During the 16 months that they were on the job they planted out a total of 12,175 trees, mostly koa, on approximately 63 acres. These have grown very rapidly and have been cared for by periodic weeding until the majority of them have passed the danger point of being smothered by further rank growth. With the aid of two local Hawaiian laborers whom I plan to keep at the job of weeding, they will be cared for until the end of this year, when the trees will need no further attention.

It is very difficult to obtain citizen labor for tree-planting work. The planting gang in Makiki Valley consists of older Portuguese men. It is impossible to get the younger Portuguese to do this kind of work.

The gang of Hawaiians, which has just completed the planting work in Manoa Valley, is now well trained to the work and is equally competent to construct satisfactory fences. For this reason I desire to hold the men together, and for this purpose I propose, with your approval, to shift them to the Waianae district, Oahu, where I believe a start should be made in reforestation, in an experimental manner at first, the reserves in that dry region.

The need for reforestation in this region was set forth by my predecessor in his report of August 9, 1912, recommending the creation of the Nanakuli forest reserve, as follows:

"One essential point in common is that all these valleys are on the lee side of Oahu and hence are in a dry district where every source of water, present or prospective, has high value. The forest problems here are to restore, as far as may be practicable, the original conditions of forest cover on the upper slopes, where appear the scanty but highly valuable springs, and to arrange for the extension of the forest, naturally or by artificial planting, on such sections of the lower slopes as cannot to good advantage be devoted to more intensive forms of agriculture.

\* \* \* The native forest should be assisted to come back and should thereafter be there maintained. If this is done I believe that springs that are now irregular and that flow only for a short time after rains will be made more steady and dependable. \* \* \* The first move in such a program is to get the forest back."

As yet the government has done nothing in this line in this district, and by starting some tree planting in this region now I wish to refute the statement commonly made that the government puts open land into forest reserves and never plants it up. The Waianae Company has done a large amount of tree planting in the upper part of Waianae Valley in past years with excellent results, and within a year has fenced off the upper part of Makaha Valley as a private forest reserve and may undertake reforestation there also. Both of these valleys produce more or less water, and a forest at their heads will insure the steadiness of this water supply.

In a recent trip to all of the valleys from Nanakuli to Makua

I was impressed by the apparent increase in water supplies wherever the forest had received protection.

The Nanakuli reserve is now fenced, but needs reforestation at the head of the valley to insure the permanence of the small stream which runs there for most of the year.

The Lualualei reserve is all fenced, all cattle are excluded, and fairly lively streams flow down from Mikilua and Puhawai.

The Waianae reserve, which has not only been fenced, but also almost completely reforested, has an abundance of water compared with the two reserves mentioned above. In Makaha there was a fairly large stream flowing a long distance down the valley.

The Makua-Keaau reserve, nearer to the dry end of the island, to be sure, shows little signs of water. The boundary has not been fenced, and cattle still do damage to the remnant of native forest.

Nanakuli, Lualualei and Makua, therefore, need attention in the line of reforestation, and I propose to start at Mikilua, in the Lualualei reserve, where there is a constant stream and suitable location for a nursery. The army also plans to construct a wagon road over the mountain at this point, and this makes it more than ever desirable that this small stream be increased if possible by reforestation. On the upper slopes near the cliffs, kukui and koa are found, and should, I believe, be used in reforestation work where they are suitable. On the lower slopes in drier country other species, such as *Acacia arabica* and *Acacia catechu*, should be tried out. An excellent opportunity is presented here for testing advantageously the trees which are best suited to the drier situations in these Islands and for obtaining knowledge and experience along this line which at present are lacking.

No special equipment beyond the erection of a rooming shack for the men, costing in the region of \$200, will be necessary.

If this plan meets with your approval, the men will begin the work toward the latter part of this month and commence planting at the higher elevations, where the trees will receive moisture during the day season.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

# Division of Entomology

## ANNUAL REPORT.

Honolulu, May 2, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I submit herewith in accordance with the law a brief report of the work of the Division of Entomology for the annual period 1917-1918.

No new work has been undertaken since the organization of the Division at the beginning of the biennial fiscal period, July 1, 1917, owing to the uncertainties of travel caused by the European War. The beneficial insects previously introduced have been propagated and distributed without interruption, although there is abundant proof of their establishment. It is considered that this practice is beneficial, since there is a tendency, in isolated localities, without great quantity of variety of fruit, for the insects to diminish greatly or to disappear from time to time in the absence of their hosts. This is especially true of those species with weak flight, like *Tetrastichus* and *Paranagrus*. The latter does not seem to be able to maintain itself, on the lowlands, in sufficiently large numbers to be serviceable, and the practice with it has always been to stock new fields of corn when the plants are about a foot high, or to use a "catch crop" to multiply the parasite.

The distribution of the different parasites since January 1, 1918 (the date of the last report), has been as follows:

### TABULATION SHOWING THE LIBERATION OF BENEFICIAL INSECTS, 1917.

	Oahu...	Kauai...	Molokai...	Maui...	Hawaii...	Lanai...	Total...
<b>FRUIT-FLY PARASITES*:</b>							
<i>Tetrastichus giffardianus</i>	7,913	200	....	....	...	...	8,113
<i>Diachasma fullawayi</i> ...	675	....	....	55	...	...	730
<i>Diachasma tryoni</i> .....	1,758	3,020	....	190	160	62	5,190
<i>Dirhinus giffardi</i> .....	1,800	....	....	....	...	...	1,800
<i>Opius humilis</i> .....	475	....	....	....	...	35	510
<i>Galesus silvestri</i> .....	455	....	....	....	...	...	455
Total .....	13,076	3,220	....	245	160	97	16,798
<b>HORN-FLY PARASITE†:</b>							
<i>Splangia cameroni</i> .....	60	....	....	....	...	...	60

\* Liberated at:—OAHU: Honolulu, Mokuleia, Waianae, Pauoa. HAWAII: Kohala. MAUI: Hana, Paia, Wailuku. KAUAI: Lihue, Homestead. LANAI: Keomuku.

† Liberated at:—OAHU: Honolulu.



MELON-FLY PARASITE‡:							
<i>Opius fletcheri</i>	.....15,221	690	....	729	175	...	16,815
CORN LEAF-HOPPER							
PARASITE§:							
<i>Paranagrus osborni</i>	....59,776	23,350	5,100	21,250	...	135	109,611

It is interesting to note in this connection that the examination of a vast quantity of fruit-fly material by the U. S. Bureau of Entomology office in Hawaii shows an increase of about ten per cent in the total parasitism in the fruit fly during the past year, and the facts brought out in their work are confirmed by the greater abundance of fruits in the markets, i. e., Kona oranges.

The inability to undertake new work has afforded leisure for study, and many of the problems connected with the control of insect pests have been gone over afresh; it has also allowed the Entomologist to undertake a considerable amount of systematic work on the Board's collection of insects, which has been greatly improved. In connection with this work three papers have been published by the Entomologist, as follows:

"Description of a New Species of *Spalangia*" (Proc. Hawaiian Entomological Soc. III, p. 202, Dung Fly Parasite); "Notes on Hawaiian *Prosopidae*" (in course of publication); "A New Genus *Pteroptricine Aphelininae* (Mealy Bug Parasite)" (in course of publication). Papers are also in preparation on the "Natural Enemies of *Coccidae*," and on "The Collection of *Braconidae* Made by Mr. F. Muir During the Progress of the Cane Borer Work, 1907-1911."

Respectfully submitted,

DAVID T. FULLAWAY,  
Entomologist.

## REPORT FOR APRIL.

Honolulu, May 22, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—During the month of April the insectary handled 20,300 pupae of the melon fly, from which there were bred 818 females and 679 males *Opius fletcheri*.

The distribution of parasites was as follows:

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‡ Liberated at:—OAHU: Moiliili, Niu, Honolulu, Mokuleia, Waianae, Pearl City, Castner. HAWAII: Paauhau. KAUAI: Hanalei, Lihue, Kealia. MAUI: Hana, Haiku.

§ Liberated at:—OAHU: Honolulu, Kailua, Moiliili, Waipio, Pearl City, Kaneohe. MAUI: Kula, Haiku, Makawao. KAUAI: Lihue, Kilauea, Kapaa, Kealia, Waimea. LANAI: Keomuku.

Females. Males.

*Opius fletcheri.*

Oahu:		
Moanalua .....	278	173
Robinson .....	436	397
Molokai: Kamalo .....	115	70

*Opius humilis.*

Oahu: Robinson .....	18	10
Hawaii: Hilo .....	45	20

*Diachasma tryoni.*

Oahu: Robinson .....	30	15
Hawaii: Hilo .....	65	20
Maui: Paia .....	50	10

*Diachasma fullawayi.*

Oahu: Robinson .....	25	15
Hawaii: Hilo .....	80	31
Maui: Paia .....	50	35

*Galesus silvestri.*

Hawaii: Mt. View .....	720
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*Spalangia cameroni.*

Maui: Paia .....	320
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*Paranagrus osburni.*

Oahu: Makiki Nursery .....	16,700
Hawaii: Kohala .....	500
Molokai:	
Kamalo .....	1,800
Pukoo .....	1,400
Maui:	
Haiku .....	32,600
Paia .....	37,200
Wailuku .....	500

Respectfully submitted,

DAVID T. FULLAWAY,  
Entomologist.

# Division of Plant Inspection

## ANNUAL REPORT.

Honolulu, December 31, 1917.

Honorable Board of Commissioners of Agriculture and Forestry,  
Honolulu.

Gentlemen:—I have the honor to submit herewith a brief report covering the various lines of work performed by the Division of Plant Inspection during the calendar year 1917.

The work performed by the chief plant inspector and his assistants during the year 1917 consisted of the following:

1. The inspection of all fruit, vegetables and plants coming into the Territory from foreign countries and the mainland in order to prevent the introduction of pests and plant diseases which do not at present exist in Hawaii and which are injurious to agricultural interests in other places.

2. The inspection of all fruit, vegetables and plants that are shipped from the port of Honolulu to all ports of the other islands. The purpose of this inspection is to prevent the spread to adjacent islands of any pest accidentally introduced on Oahu, of which Honolulu is the port of entry and consequently the most likely place for an accidental introduction to make its first appearance.

### STAFF.

Your superintendent has continued as Chief of the Division during this year and had the following assistance in the quarantine inspection:

Mr. D. B. Kuhns, as assistant inspector, whose time was spent mostly on the harbor front in looking after all vessels arriving at Honolulu. Under him there are two assistants, Messrs. Edward Drew and Isaac Kahele. With this force of men I am able to handle all inspections of outside shipments as well as the inter-island inspection. In connection with the work, Brother Matthias Newell has continued as fruit and plant inspector at Hilo, Hawaii. On January 1 Mr. Will Cooper was appointed plant inspector at Kahului.

The following gentlemen, who are acting as honorary inspectors at various ports on the other islands, have not reported any active service during the year. In fact, it seldom occurs that produce goes to the smaller ports of the other islands without first passing through Honolulu.

Honorary inspectors: Mr. E. E. Madden, Mahukona, Hawaii; Mr. Geo. B. Leavitt, Eleele, Kauai; Mr. G. C. Munro, Keomuku, Lanai. Mr. W. D. McBryde resigned as honorary inspector in March, and Mr. Geo. B. Leavitt was appointed to succeed him.

## INSPECTION.

Owing to the war some of the larger freight carriers were taken off during the year and replaced by numerous smaller boats, some of which carried no cargo of a vegetable nature, especially those in transit, yet they carried quantities of fruit and vegetables for their own consumption and required our attention during their stay in port. The increase in the number of vessels arriving here and the congestion of freight on board as well as on the docks caused great delay and made it necessary to appoint an inspector for the port of Kahului, thereby relieving us of the inspection at Honolulu of coast shipments for that port. These were usually badly mixed with other cargo and made thorough inspection here difficult.

During the last session of the Legislature a law was passed giving authority to the Board of Agriculture and Forestry to make the necessary changes in reorganizing the Division of Entomology by separating it into two divisions, viz: the Division of Entomology and the Division of Plant Inspection, and by making appropriate changes in the law to govern both divisions.

The Board of Commissioners of Agriculture and Forestry, after due consideration and recommendation, found that since the work of the Division of Plant Inspection was along the waterfront it would be best for efficiency to locate the office in that district, and accordingly a building has been erected on ground set aside by the Governor and will be ready for occupancy January 1, 1918.

The building and its equipment has been carefully planned and every precaution taken for efficiency and convenience. Fumigation vaults are separate from the main building and are so placed that an extra unit may be added when found necessary. By making use of two small fumigating units of the old equipment, we have at present about 15,200 cubic feet of space for fumigating purposes. In addition to the building we have an incinerator equipped with a Ray rotary oil burner. With this outfit we will be able to dispose of all condemned fruit, plants and vegetables as well as to subject soil to a sufficient heat to kill all plant germs and bacteria. The destruction of condemned materials has been one of the most annoying problems in the past, and with this new equipment we can handle such materials without risk. The laboratory is furnished with gas and electricity, and the necessary instruments for thorough work have been purchased.

It is not our intention to have a large library, as we will have access to the library at the King Street office, but we shall endeavor to collect certain reference books pertaining to foreign insects and plants and to assemble as complete as possible a file of all horticultural laws from the mainland and foreign countries.



## WORK PERFORMED.

During the year we inspected 721 vessels arriving at the ports of Honolulu, Kahului and Hilo. Of these, 340 carried vegetable matter consisting of 16,164 lots and 325,346 packages. Of this amount 320,329 packages were fruits and vegetables, mostly from the mainland of the United States and imported for food; 2668 packages were seeds of plants, flowers and vegetables; and 2439 packages were plants. Of these shipments 800 packages were destroyed, 3075 packages were fumigated before delivery, and 67 packages were returned to the shipper, on account of infestation or for being contraband under rulings of the Federal Horticultural Board.

There has been a material increase in the number of vessels arriving at the various ports in the Islands, but owing to the war and the congestion of freight on the Coast, the actual shipments of a vegetable nature have not increased in proportion to the number of arrivals.

## RICE AND BEAN AND GENERAL SHIPMENTS.

During 1917, 380,149 bags of rice and 34,042 bags of various kinds of beans were shipped into the Territory through the ports of Honolulu and Hilo from Japan and China. Shipments of this nature are rigidly inspected for cereal pests, and it is gratifying to note that no rice or beans were held for infestation during the year. The establishment of plant quarantine stations at various Japanese ports and strict observance of rules governing rice and bean importations have produced splendid results.

A large consignment of wheat arrived at the port of Hilo direct from Japan and was found infested with the common rice weevil. As the facilities at Hilo were inadequate for the handling of such a quantity, the shipment was sent to Honolulu and was fumigated in our large chamber.

## INTER-ISLAND INSPECTION.

During 1917 we have continued the inspection of horticultural products shipped from Honolulu to all other island ports. Particular care was taken in the case of soil attached to the roots of plants, as plant diseases and insect pests are readily disseminated in this way.

During the year 725 steamers plying between Honolulu and ports of the other islands were attended to and 11,227 packages of plants, fruit and vegetables were inspected. Of this number, 134 packages were rejected either on account of infestation or having undesirable soil attached to the roots of plants.

## FEDERAL INSPECTION.

As agents and collaborators of the Federal Horticultural Board, we are greatly assisted in the inspection of foreign importations. The enforced regulation of requiring permits for all foreign plant shipments has been a big factor in preventing the promiscuous lugging in of plants by aid of the ships' crews. Importers of plants with the required permits can, however, ask the assistance of a ship's officer if some rare or tender plant requires care on the ocean trip.

A decrease is noted in the shipments of plants by parcels post from foreign countries, and this is partly due to the war as well as to the regulations of the Federal Horticultural Board prohibiting such shipments by mail. But despite the fact, many people have not as yet become acquainted with this regulation, even though it has been widely published.

## INJURIOUS INSECTS AND PLANT DISEASES.

During the year the usual number of dangerous insects and plant diseases have been intercepted in course of inspection. The following table shows the number of species and genera found:

Beetles .....	17	Genera	20	Species
Butterflies and Moths.....	7	"	7	"
Ants .....	7	"	10	"
Scale Insects .....	10	"	15	"
Plant Lice .....	4	"	4	"
Various .....	14	"	17	"

Among the more important pests destroyed during the year were:

The Argentine ant, which was discovered on two occasions. Other species of ants which have not as yet gained entrance, as well as species which are already established, have frequently been found in plant shipments.

A weevil, the larvae of which are very destructive to roots of plants, was taken in the soil about the roots of a potted plant from Japan.

Bagworms, not as yet known in the Territory, were also found on plants from the Orient.

*Cladosporium citri*, a very dangerous fungus disease of citrus fruit, has in numerous instances been discovered on fruit taken from the baggage of passengers from the Orient.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

## REPORT FOR APRIL.

Honolulu, April 30, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of April, 1918, as follows:

During the month there arrived at the port of Honolulu 49 vessels, of which 18 carried vegetable matter, with the following results:

Disposal.	Lots.	Parcels.
Passed as free from pests.....	681	18,791
Fumigated .....	14	50
Burned .....	22	22
Returned .....	3	3
Total inspected .....	720	18,866

Of these shipments, 18,589 packages arrived as freight, 181 packages as mail, and 96 packages as baggage.

## RICE AND BEAN SHIPMENTS.

During the month 17,113 bags of rice and 1310 bags of beans arrived from Japan and Oriental ports, all of which were free from pests.

## PESTS INTERCEPTED.

Approximately 5553 pieces of foreign baggage belonging to passengers and immigrants from foreign countries were examined, and from these were seized and destroyed by burning 9 lots of fruit and 14 lots of vegetables.

The following disposal was made of plants and seeds from various sources:

On April 8 a package of palm seeds in the mail from Egypt was fumigated for an infestation of scale insects, and passed.

On the same date a package of tree seed from Japan in the mail was returned as unmailable.

On April 14 a case of fruit and ornamental trees from Japan was fumigated because of ants in the packing. The case was sprayed with kerosene as an added precaution.

On April 16 a package of orchids in a passenger's baggage from Manila was fumigated for an infestation of ants and scale insects.

On April 29 a parcel of sweet potatoes in the mail from Japan was returned as unmailable.

During the month we have mailed 214 notices of inspection rules to nurserymen of the United States and foreign countries.

#### HILO INSPECTION.,

Brother M. Newell reports the arrival of six steamers, three of which carried vegetable matter consisting of 118 lots and 2090 parcels. The Anyo Maru arrived direct from Japan, bringing 900 bags of rice, 539 bags of beans, 15 bags of peas and 2 bags of sesame seeds, making a total of 1456 packages, all of which were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Will J. Cooper, Plant and Fruit Inspector for Maui, reports the arrival of three vessels at the port of Kahului, one of which brought vegetable matter, consisting of 4 lots and 185 packages, all of which were found to be free from pests.

#### INTER-ISLAND INSPECTION.

Fifty-eight steamers plying between Honolulu and other Island ports were attended, and the following shipments were passed as free from pests:

Taro .....	796	bags
Vegetables .....	266	packages
Plants .....	177	"
Fruit .....	13	"
<hr/>		
Total inspected .....	1252	"

Two packages of plants were refused shipment on account of infestation and undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry

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### ANNUAL REPORT.

Honolulu, May 1, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—The year 1917 became remarkable in the Hawaiian live-stock annals on account of the first appearance of anthrax among the cattle and horses of the Territory. This fatal disease, which affects all classes of animals, and is transmissible to man, had never been known here before, and as it could not



possibly have been brought here by infected animals, the conclusion was reluctantly arrived at that the disease had been introduced and spread maliciously.

The first appearance of the disease occurred on a ranch at Hanalei, on Kauai, and unfortunately a considerable number of animals had died before the diagnosis of anthrax was made and many carcasses had been buried in shallow graves. Serum vaccine was cabled for and pending its arrival every measure was taken to prevent the further spread of the disease. The cattle were then dying at the rate of ten per day, and it soon became evident that nearly all the paddocks on the ranch had been infected, so nothing could be gained by moving the cattle around. A strict quarantine, enforced by guards, was established, and, as soon as received, the entire herd, some 2400 head, were injected with the serum simultaneous anthrax vaccine. Up to this time some 225 animals, mostly cows, had died, and a large force of men was required for burning the carcasses and fencing in the graves of the earlier cases. The vaccination did not stop the losses immediately, so it became necessary to revaccinate the whole herd one month later, when a total of about 300 head had died. The disease had then lasted from the beginning of April, was well under control by the middle of May, though a few scattering cases were observed as late as August.

How the disease was scattered over the ranch is not known to this day. The contents of the salt and bonemeal boxes in the infected pastures were tested by animal inoculations without result. Practically all the paddocks are high and well drained and offer little or no opportunity for the permanent establishment of the anthrax infection. This makes the sudden appearance of the disease in that isolated district so much more remarkable.

However, the end was not yet. During the middle of May, anthrax suddenly made its appearance in a dairy herd almost in the heart of Honolulu. Of approximately 100 milch cows, one-third died in the course of 48 hours. The place was quarantined and the remaining animals were serum vaccinated. In this case the disease was found to have been spread by means of a bag of beet pulp, which was found to be heavily infected with anthrax spores. Only this bag out of a shipment of several hundred proved to be infected, and as the feed room at the dairy was left open at all times, the matter of infecting one of the bags of feed by pouring an anthrax culture over it would meet with little difficulty.

The final surprise came, however, when anthrax was reported from the Island of Maui. There in the course of ten days, during the month of June, no less than seven distinct outbreaks occurred in widely scattered districts. The losses, however, were insignificant, totalling less than fifty head of cattle and horses. Whoever scattered the disease in this case had evidently been in a hurry, as well as being ignorant about how to make the infec-

tion do the most damage. As in the other outbreaks, all animals in the infected pastures were immediately serum vaccinated, after which few losses occurred. As all of these outbreaks appeared in pastures contiguous to a highway, it is presumed that the fiend who scattered the disease was traveling in a carriage or automobile, and simply throwing the infected material into the paddocks as he passed them. It is needless to say that by this time the cattle raisers and live-stock owners all over the Islands were thoroughly alarmed and unprecedented measures were adopted to protect the large cattle ranches on Hawaii and elsewhere.

The Territorial Legislature was fortunately in session when the first outbreak of anthrax occurred, and an appropriation of \$25,000 was made immediately available, with which to fight the disease. Had it not been for this expeditious measure it is doubtful whether the disease could have been suppressed so quickly and completely as was the case.

The serum vaccine used for this purpose is of quite recent origin and would not have been available had the outbreaks happened the year before. Our experience with it has demonstrated it as a valuable preventive and an effective cure in most cases that come under treatment soon enough. It is still rather expensive, costing 30 cents per dose, but it is expected that improved methods of manufacture will greatly reduce this price. A total of 13,000 doses was used, and the results fully justify the expenditure. The greatest item of cost in fighting an anthrax epidemic is the disposal of the carcasses by cremation, and unless this is done, and done thoroughly, there is little likelihood of ever getting rid of the disease, as the anthrax infection can live for years in the ground.

#### BOVINE TUBERCULOSIS ERADICATION.

For the purpose of eradicating tuberculosis from the dairy herds of the Territory, the 1917 Legislature appropriated the sum of \$20,000 wherewith to reimburse the owners of tuberculous cattle when these are condemned as dangerous to the public health. Of this sum, about one-half has been expended on the Island of Oahu alone, where a few badly infected herds were still found. On the other islands many districts are completely free from the disease and it is fully expected that the sum appropriated will prove sufficient for the purpose.

The efforts of the Federal Government to suppress this insidious disease by the creation of a Bovine Tuberculosis Control Division, under the Department of Agriculture in Washington, is sufficient guaranty of the soundness of the policy pursued by this Division for the past seven years.

## OTHER LIVE-STOCK DISEASES.

With the exception of anthrax and tuberculosis, the live-stock of the Territory have been singularly free from infectious diseases during the past year. A few isolated cases of glanders have been reported from the Kohala district, but a similar outbreak recently investigated in the Hamakua district proved not to be glanders, but epizootic lymphangitis. Hog cholera seems to have entirely disappeared, and even hemorrhagic septicemia or swine plague is rarely heard of, and still there were more hogs raised in the Territory during the past year than ever before.

Though rabies is still prevalent in the Pacific Coast States, the continued four-months quarantine of all dogs has proved effective in keeping the disease out of the Territory. It became necessary during the year to enlarge the dog quarantine division with twelve additional kennels.

## IMPORTATION OF LIVE-STOCK.

During 1917 the following live-stock arrived in the Territory: Horses, 245; mules, 244; cattle, 272; sheep, 68; swine, 24; dogs, 67; poultry, 489 crates.

Of these animals, the greater majority of the horses were for the military forces stationed here. The mules as usual were for the plantations. The cattle were nearly all milch cows, Holstein grades with a few pure-bred bulls and cows of the same breed. There were also 30 head yearling Shorthorn bulls, pure-bred. Among the sheep was one importation from New Zealand of 50 pure-bred Merino rams. The swine were principally Berkshire boars.

## RABBITS AND BELGIAN HARES.

The 1917 Legislature passed a law (Act 50) forbidding the keeping and breeding of rabbits or Belgian hares in the Territory, except on permit issued by this Board. In accordance with this law, which principally aims at keeping these animals confined and thereby preventing them from becoming pests, a new rule (Division of Animal Industry, Rule XIII) was approved by the Governor on October 30, 1917, since which date 39 permits to keep and breed rabbits have been issued.

Respectfully submitted,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.



## REPORT FOR APRIL.

Honolulu, May 29, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I beg to submit herewith a report covering the work of the Division of Animal Industry for the month of April, 1918.

In preparing an exhibit for the Territorial Fair, attention was called to the fact that our supply of printed regulations governing the importation of live-stock and other animals into this Territory had been almost completely exhausted. As the old regulations, effective since January 1, 1910, were badly in need of revision, several rules having become obsolete or been revoked while others needed additional paragraphs on account of more recent legislation, both Federal and Territorial, it was deemed advisable to reconstruct and make more concise the new edition. It was also considered well to separate the regulations governing importations from those dealing with the control and suppression of animal diseases within the Territory. These latter regulations will also have to be brought up to date, though several of them may be retained in their present form.

The new importation rules which are submitted\* herewith for the Board's approval have been made to conform with the Federal regulations now in force, both as they pertain to live-stock in interstate traffic and to importations from foreign countries. The most important change, to which the Board's attention is especially called, occurs in Rule V relative to the introduction of cattle for dairy and breeding purposes from the mainland of the United States. The revised rule requires that such cattle shall not alone have passed the tuberculin test, but must come from herds which have been free of tuberculous infection for one year. Under these conditions such cattle will be admitted to the Territory without further restrictions. On the other hand, cattle which have passed the tuberculin test, but which do not come from herds certified to have been free of tuberculous infection for one year, must on arrival go to quarantine and remain there until it can be definitely ascertained that they do not carry the infection with them. This added restriction became imperative when quite recently a number of tuberculous cattle were found among an importation of tuberculin-tested dairy cows. The rule may appear drastic, but unless the introduction of new centers of infection with imported cattle can be prevented, our efforts at eradicating the disease within the Territory will be wasted. Besides, the rule safeguards the purchaser or importer in compelling him to employ reliable officials or else take the risk of having his cattle quarantined upon arrival and possibly destroyed without compensation.

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\* These rules are printed in the By Authority pages of this issue.



Rule VII, pertaining to the importation of hogs, has been strengthened by requiring a certificate to the effect that the hogs in question have not been submitted to the serum-simultaneous or double treatment for hog cholera within 30 days prior to shipment.

#### TERRITORIAL FAIR EXHIBIT.

A number of highly interesting specimens of diseased organs, especially from tuberculous cows, have been mounted for purpose of exhibition.

In view of the agitation that is now being created for the purpose of discrediting the efforts of this office at eradicating bovine tuberculosis, it may have a salutary effect on the same agitators to get acquainted with the appearance of the lungs, livers and milk glands of some of the cows from which they have been and are proposing to continue to supply milk. The specimens may also prove of interest to the milk consumers and help them to decide whether they would prefer, in the future at least, to be able to obtain milk from healthy cows or whether they will be satisfied with the product of the diseased animals from which these organs were taken, pasteurized or otherwise.

The text for a number of posters illustrating the work of this Division has also been prepared and is now ready for the sign painter.

Tuberculin testing and importations of live-stock during the past month are dealt with in the report of the Assistant Territorial Veterinarian, herewith appended.

Very respectfully,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.

#### REPORT OF ASSISTANT VETERINARIAN.

Honolulu, May 20, 1918.

Dr. V. A. Nörsgaard, Chief, Division of Animal Industry, Bureau of Agriculture and Forestry, Honolulu.

Sir:—I beg to submit the following report for the month of April, 1918:

## TUBERCULOSIS CONTROL.

The following dairy cattle were tested during the past month:

	Tested.	Passed.	Cond'm'd.
W. Meyers .....	32	29	3
Ben Mahi .....	16	16	0
R. McKeague .....	7	7	0
Fred Smith .....	2	2	0
M. Abrean .....	1	1	0
James Gibb .....	13	13	0
M. Souza .....	1	1	0
Frank Gerard .....	3	3	0
F. Johnson .....	7	7	0
A. C. M. Rasch.....	1	1	0
J. Schwank .....	9	9	0
Fred P. Johnson.....	25	22	3
M. Iguchi .....	13	13	0
S. Kudema .....	13	13	0
Dr. McGettigan .....	2	2	0
Frank Andrade .....	42	42	0
Gospel Mission Home.....	2	2	0
C. W. Lucas.....	6	6	0
W. Meyer .....	27	26	1
Leahi Home .....	19	19	0

From the above tabulated list it will be seen that a total of 241 head were tested, out of which number 234 were passed and tagged and 7 condemned and branded.

Of the seven condemned cattle, five have been slaughtered and lesions of tuberculosis found in each case. The carcasses were passed for food. Two are still alive, having recently calved. They will be slaughtered within the next two weeks.

## LIVE-STOCK IMPORTATIONS.

S. S. Hyades, San Francisco: 1 ct. poultry.

S. S. Lurline, San Francisco: 2 dogs, C. W. Lucas; 3 Holstein cows, 1 dog, R. McCorrison; 10 mules, Haiku Fruit and Packing Co.; 1 ct. poultry.

S. S. Columbia, Orient: 1 leopard, Horace Golden.

S. S. Manoa, San Francisco: 1 ct. rabbits, H. McDuffie; 1 ct. pigeons, 9 cts. poultry.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

# Marketing Division

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## ANNUAL REPORT.

Honolulu, April 26, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—On July 1, 1917, the Marketing Division was transferred to the Board of Agriculture and Forestry by Act 206 of the Session Laws of 1917. The books were audited, and a new system installed by the Audit Company of Hawaii. The new system was more complicated than the previous one, and it has taken time to get a bookkeeper who could keep it in working order.

The note for \$3000 owned to the Bank of Hawaii when the Division was placed under the supervision of the Board has been paid out of the earnings of the Division. Now that this note has been paid it will be possible to work up a cash capital with the earnings, which will enable the Division to make more prompt settlements with consignors, and when necessary advance them money on non-perishable produce received for which there is not a ready market.

Practically all of the pineapple crates have been sold, and as soon as the weather permits the crates that have been stored at Wahiawa and Aiea will be hauled. All the crates stored in Honolulu have been sold. As soon as the attorney general settles the claim against Mr. F. E. Haley for crates sold to him, and which are still unpaid for, we will be able to close the crate account. In closing this crate account there will probably be a small loss due to some crates rotting while in storage at the Territorial Immigration Station, and the necessity for selling some below cost in order to dispose of them. This loss can be made up out of earnings.

Due to the lack of equipment, poor location of the Division for retailing, and the uncertainty of the supplies that could be sold at retail, the retail departments did not pay expenses and, with the consent of the Board, they were closed on November 30. The closing of the retail departments has in no way affected the sale of Island produce consigned to the Division. In fact, it has given the Division more time to sell Island produce to wholesalers and the Army at less expense to the Territory and with as good returns to the producer. The force of employees has been reduced to the actual needs of the consignment department.

During the year the Division received a large number of consignments of produce from the different islands, with the exception of Kauai. Practically all the produce received was readily sold at the prevailing market prices. Very little beef was received

during December, and the Division was unable to supply all its regular wholesale customers.

A record crop of beans was harvested on Maui this year, the largest portion of which was handled by the Division and sold for very good prices. As there was a very limited demand in the Honolulu market for the Maui red beans, most of them were shipped to the Coast.

About 400 bags of beans from Maui were received in very poor condition, and are hard to sell at any price. An artificial drier on Maui to take care of the bean and corn crops this year would have saved many hundred dollars. The producers also need better facilities for cleaning and grading their crops.

There was not as great a demand for seed from the Division as was anticipated by the last Legislature when it made an appropriation of \$2500, and as a consequence there was a lot of seed left on hand at the end of the 1917 planting season. With the Governor's approval, \$688.40 worth of seed was turned over to the Army for the post garden at Wahiawa on the understanding that the seed was to be paid for out of the crops, if any, either in cash or produce. A report has been requested from the Army on this matter. The other seed on hand is getting old and is losing its germinating powers.

Very respectfully,

O. B. LIGHTFOOT,  
Acting Superintendent.

#### REPORT FOR APRIL.

Honolulu, May 1, 1918

Board of Commissioners of Agriculture and Forestry, Honolulu,  
T. H.

Gentlemen:—During the month there were few large consignments received. The sales for the month amounted to \$11,964.82, which are \$1156.63 less than the sales for the month of March. A few small consignments of Irish potatoes were received from Hawaii and this island, but are not selling very fast, as the market is well supplied with California potatoes, which are selling for \$1.90 per hundred. Island potatoes are selling from \$2 to \$3 per bag, according to the size.

There is a very good demand for sweet potatoes, which are selling at \$1.75 per hundred. The Division is getting regular shipments of sweet potatoes from Molokai, and a few small shipments from this island. Due to the shortage of taro, and the high price of poi, the Hawaiians are using more sweet potatoes, and there are not enough coming in to the market to supply the demand.



The Raymond Ranch is again shipping beef to the Division. A shipment received on the 15th of the month was the first consignment received from the Raymond Ranch for two months. During this time they have been shipping their cattle to the Mutual Produce Company.

Enclosed herewith is a statement of the operations for the month and a copy of the general ledger trial balance.

Respectfully,

O. B. LIGHTFOOT,  
Acting Superintendent.

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## Exhibit at Fair

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PLAN OF EXHIBIT OF THE BOARD OF AGRICULTURE  
AND FORESTRY AT THE FIRST TERRITORIAL  
FAIR, JUNE 10-15, 1918, APPROVED BY THE  
BOARD, APRIL 24, 1918.

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### DIVISION OF FORESTRY.

- I. Forest Extension.
  1. Nursery stock of seedlings and transplants in boxes, pots, and tubs.
  2. Forest and ornamental tree seed pods and seed.
- II. Forest Protection.
  1. Working erosion model showing beneficial effect of forest cover on runoff.
  2. Standard forest reserve monument, cloth posters, list and maps of forest reserves.
- III. Miscellaneous.
  1. Stands of wood specimens of introduced and native trees.
  2. Samples of bamboo growing in Hawaii. (At the special request of the Fair Commission.)

### DIVISION OF ANIMAL INDUSTRY.

- I. Charts showing:
  1. List of animal diseases kept out of Territory by inspection and quarantine.
  2. List of animal diseases which have gained entrance.
    - (a) Statistics and methods showing those which have been eradicated.
    - (b) Statistics showing methods and rate at which others have been reduced.
- II. Specimens of organs resulting from diseases listed in I, (a) and (b).
- III. Photographs of stock.
- IV. Miscellaneous.

## MARKETING DIVISION.

I. Display of Island produce showing how it should be properly graded and packed for shipment to market, as follows:

- (a) Bananas, packed in leaves for shipment.
- (b) Beans, packed in double sacks graded and in single sacks not graded.
- (c) Cabbage, packed in crates and in bags.
- (d) Eggs, stamped and packed in twelve dozen H. D. egg crates and thirty dozen Standard egg crates.
- (e) Onions, packed in crates and bags and a few onions showing the different methods of curing.
- (f) Pineapples, packed in crates for shipping to the Coast.
- (g) Potatoes, graded and not graded.
- (h) Poultry, shipped in rough crates and in collapsible chicken crates.
- (i) Strawberries, packed in quart baskets and in bulk.
- (j) Tomatoes, packed in Chinese baskets, berry baskets and tomato crates.

II. Island Corn and Beans.

Sample bottles of as many varieties of Island corn and beans as can be obtained.

Note:—Exhibits for the Divisions of Entomology and Plant Inspection have already been planned for by the Economic Entomological Committee of the Territorial Fair Commission.

The exhibits were placed substantially as planned, and attracted the attention of crowds of interested spectators. The insects were of particular interest, and the working erosion model, showing the beneficial effect of a forest cover on the runoff, illustrated admirably the lesson which is of vital importance in these Islands.

Respectfully submitted,

C. S. JUDD,  
Executive Officer.

---

**BY AUTHORITY.**

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Notice is hereby given that under the provisions of Chapter 37, R. L. H. 1915, a public hearing will be held by the Governor of the Territory and the Board of Commissioners of Agriculture and Forestry on Wednesday, the 19th day of June, 1918, at 9 o'clock a. m., in the office of said Board at the Government Nursery, King Street, Honolulu, to consider the defining of the limits and the setting apart as forest reserves of certain government and other lands, more particularly as follows:

- 1. Island of Kauai, District of Kona, Land of Kalaheo (Papapahola-hola Spring), area 54 acres, more or less.
- 2. Island of Oahu, District of Koolaupoko, Land of Waiahole (Waiahole), area 1169 acres, more or less.
- 3. Island of Maui, District of Hamakuapoko, Land of Makawao (addition to Makawao Forest Reserve), area 263 acres, more or less.

4. Island of Hawaii, District of Puna, Land of Keauohana (Keauohana), area 272 acres, more or less; and to consider the withdrawal from the existing Honolulu Watershed Forest Reserve, District of Honolulu, Island of Oahu, of three small parcels of land on Tantalus Heights, having areas of 1.52, 0.137 and 0.103 acres respectively.

Maps and descriptions of the said lands are on file in the office of the Superintendent of Forestry, where they are open to the inspection of the public.

At the said time and place all persons who so desire will be given full opportunity to be heard upon the subject matter of this notice and to present evidence and arguments in person, by proxy, or by letter, either for or against the setting apart of said lands as forest reserves or the elimination of said lands from the existing reserve.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

The Capitol, Honolulu, June 3rd, 1918.

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**BY AUTHORITY.**

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**TERRITORY OF HAWAII.**

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**BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.**

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**RULE I.—DIVISION OF PLANT INSPECTION.**

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The Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii hereby amends Rule I of the Board concerning the importation or introduction into the Territory of Hawaii of fresh fruit from East or West Indies, Asia, Australasia, Oceanica, Malaysia, Mexico, Central and South America, approved by the Governor of Hawaii on October 25, 1904, so as to read as follows and to be known as Rule I—Division of Plant Inspection:

Section 1. For the purpose of preventing the introduction into the Territory of Hawaii of fruit flies and insects, their eggs, larvae or pupae, and all diseases of plants, fruits or other vegetation of value, all persons, companies and corporations are hereby prohibited from introducing, importing or bringing in baggage or otherwise into the Territory of Hawaii, or into any of its ports for the purpose of debarkation into the said Territory, any fresh fruit from East or West Indies, Asia, Australasia, Oceanica, Malaysia, Mexico, Central and South America.

Section 2. All plants, cuttings, scions, buds, bulbs, roots or tubers, seeds, grains or cereals may be imported into the Territory of Hawaii from any foreign country, provided, however, that permission has been granted by the Federal Horticultural Board of Washington, D. C., and that such permit has been received by the Chief Plant Inspector of the Territory. All plants, cuttings, scions, buds, bulbs, roots or tubers, seeds, grains or cereals, including those from the mainland of the United States, are subject to inspection upon arrival into the Territory of Hawaii. All persons and corporations are hereby prohibited from removing or taking any of the above articles from a wharf or landing place without first having notified the Division of Plant Inspection of the arrival of said article or articles and having received permission from the duly authorized officer to remove or take the same.

Section 3. All fruits, vegetables, plants, parts of plants, bulbs, roots or tubers, seeds, grains or cereals from the United States of America and the Dominion of Canada that are not prohibited under rules and regulations of the Federal Horticultural Board of Washington, D. C., may be introduced, imported or brought into the Territory of Hawaii either by freight, express or as packages of passengers, provided, however, that all such fruits, vegetables, plants, parts of plants, bulbs,

roots, seeds, grains and cereals are free from pests and diseases. All persons importing, introducing, or bringing into the Territory of Hawaii any fruits, vegetables, plants, or parts of plants, bulbs, roots or tubers, seeds, grains and cereals must present the same to or notify the Chief Plant Inspector of the Board of Agriculture and Forestry before landing any of these articles.

Section 4. If any fresh fruits, vegetables, plants, cuttings, scions, buds, bulbs, roots or tubers, seeds, grains, or cereals shall be imported, introduced or brought in baggage or otherwise, into the Territory of Hawaii, or into any of its ports for the purpose of debarkation into said Territory, contrary to law or this regulation, the same shall, in the discretion of the Board of Commissioners of Agriculture and Forestry, or its duly authorized agent, officer or inspector, be immediately seized and destroyed or deported at the expense of the importer or introducer, and the person or persons or corporation introducing or importing the same shall be guilty of a misdemeanor and shall be liable to the penalty or penalties provided by law.

Section 5. This rule, as amended, shall take effect upon its approval by the Governor.

Approved this 8th day of June, 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

Honolulu, T. H.

---

**BY AUTHORITY.**

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**TERRITORY OF HAWAII.**

---

**BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.**

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**RULE III.—DIVISION OF PLANT INSPECTION.**

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The Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii hereby amends Rule III of the Board concerning the importation of rice, approved by the Governor of Hawaii on September 7, 1906, so as to read as follows and to be known as Rule III—Division of Plant Inspection.

Section 1. For the purpose of preventing the introduction into the Territory of Hawaii of insects, their eggs, larvae or pupae, and fungus diseases, injurious or liable to become injurious to rice either growing or stored, all persons, companies and corporations are hereby prohibited from introducing or importing into the Territory of Hawaii or into any of its ports, any rice infested with such insects.

Section 2. For the purpose of preventing all rice shipments from Japan for entry into the Territory of Hawaii from being infested with insects, their eggs, larvae or pupae, or fungus diseases, injurious or liable to become injurious to rice, all shippers are required to have their shipment fumigated at the port of debarkation in Japan under government supervision and before placing same on board the vessel, and all shipments must be accompanied with a certificate of fumigation signed by the proper authorized person.

Section 3. If any rice infested with insects, their eggs, larvae or pupae, injurious to rice, growing or stored, shall be imported or introduced into the Territory of Hawaii or into any of its ports, the same shall, in the discretion of the Board of Commissioners of Agriculture and Forestry, or its duly authorized agent, officer or inspector be immediately destroyed or deported at the expense of the importer or introducer, and the person or persons or corporation introducing or importing the same shall be guilty of a misdemeanor and shall be liable to the penalty or penalties provided by law.



Section 4. This rule, as amended, shall take effect upon its approval by the Governor.

Approved this 8th day of June, 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

Honolulu, T. H.

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**TERRITORY OF HAWAII.**

**BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.**

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**Rule XIX—Division of Plant Inspection.**

Rule and Regulation of the Board of Commissioners of Agriculture and Forestry concerning the Introduction of Pineapple Plants, Suckers, Sprouts or Fruit.

The Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii hereby makes the following Rule and Regulation:

Section 1. For the purpose of preventing the introduction into the Territory of Hawaii of serious pests and diseases of the pineapple plant, all persons, companies and corporations are hereby prohibited from introducing or importing or receiving as freight and express matter or from bringing or receiving in baggage or otherwise, into the Territory of Hawaii or into any of its ports for the purpose of debarkation into said Territory any pineapple plant, sucker or sprout or fruit from the West Indies, Central America, including the Panama Canal Zone, or any other locality where said serious pests and diseases exist or may become known to exist.

Section 2. Any person or persons or corporation violating the above rule shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not to exceed Five Hundred (\$500.00) Dollars, as provided by Section 529, Revised Laws of Hawaii of 1915.

Section 3. This rule shall take effect upon its approval by the Governor.

Approved this 8th day of June, 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

Honolulu T. H.

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**TERRITORY OF HAWAII.**

**BOARD OF AGRICULTURE AND FORESTRY—DIVISION OF ANIMAL INDUSTRY.**

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**REGULATIONS GOVERNING THE IMPORTATION OF LIVE STOCK AND OTHER ANIMALS INTO THE TERRITORY OF HAWAII.**

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(Effective June 8, 1918.)

Under authority of Sections 503 to 509 inclusive of the Revised Laws of Hawaii, 1915, the Board of Commissioners of Agriculture and Forestry issue the following regulations, the same to supersede all previous regulations on the same subject and to become effective upon approval by the Governor.

**RULE I.—DEFINITION OF TERMS.**

Whenever in these regulations the following words, names or terms are used they shall be construed as follows:

**Animals.** This word refers particularly to pets, zoological, menagery or wild animals, whether mammals, birds, reptiles or fishes, as distinguished from domestic animals, or live stock, and poultry.

**Domestic Animals or Live Stock.** These words refer to horses, mules, asses, cattle, sheep, goats, swine, dogs and cats.

**Horses or Horse Stock** refer to horses, mules and asses.

**Poultry** refers to chickens, ducks, turkeys, pigeons, guinea hens, peacocks, etc.

**Inspector or Inspecting Officer.** These words, unqualified, refer to veterinary officers, as the Territorial Veterinarian, the Assistant, and Deputy Territorial Veterinarians.

**Live Stock Inspector** refers to lay inspectors.

**Transmissible Diseases.** These words apply to all infectious, contagious or communicable diseases of animals.

**Territorial Veterinarian** also refers to and includes the Assistant Territorial Veterinarian and the Deputy Territorial Veterinarians at the various ports of entry.

The above definitions are not intended to be exclusive.

## **RULE II.—GENERAL PROVISIONS.**

All importations of live stock and other animals into the Territory of Hawaii from foreign countries are subject to the Regulations of the United States Department of Agriculture and permit for such importations must be obtained from Washington, D. C., by application through the office of the Territorial Veterinarian in Honolulu.

All importations of live stock from the mainland of the United States into the Territory of Hawaii are subject to the regulations of the United States Department of Agriculture governing the humane handling and safe transport of live stock in interstate trade and permit to so carry stock must be obtained for each and every shipment from the proper federal official at the port of shipment.

## **RULE III.—INSPECTION OF IMPORTED LIVE STOCK.**

Sec. 1. In order to prevent the introduction into this Territory of infectious, contagious and communicable diseases among live stock and other animals, local managers or agents of steamship and navigation lines or the commanding officer of any ship, shall notify the Territorial Veterinarian immediately upon the arrival of any ship, of the presence on board, if any, of live domestic animals, including poultry and dogs, when same are intended to be landed in this Territory, and shall upon arrival of any ship furnish the inspecting officer with a list of the number and kind of animals taken on board from any port outside of this Territory, the number and kind destined for the Territory, the names of the owners or consignees, and a report as to the condition of health and cases of sickness or death and the causes thereof among the animals while on board.

Sec. 2. If necessary to remove such animals before the arrival of the inspector they must be confined on the pier in such a manner as to facilitate inspection, but shall in no case be turned loose on the pier. Hogs and sheep shall be confined in temporary pens or crates. Cattle and horses shall be tied on the pier. No animal of any description shall be allowed to leave the pier until the Territorial Veterinarian has issued a certificate of health permitting the landing of the animal or animals in question.

Sec. 3. In no case shall the removal of live animals from the ship for inspection or other purposes, constitute an entry into the Territory until a certificate of health for such animals has been issued.

## **RULE IV.—HORSES, MULES AND ASSES.**

Sec. 1. All horse stock intended for importation into the Territory of Hawaii must be accompanied by a certificate of health, issued or approved by a veterinary officer of the United States Bureau of Animal

Industry, to the effect that the animals in question (tailed or otherwise identified), have been tested with mallein within two weeks prior to shipment and have been found free from symptoms of glanders, farcy or any other transmissible disease.

Sec. 2. All horse stock arriving in the Territory of Hawaii and coming from or through the State of California shall be quarantined at the port of entry for a period of twenty-one days counting from the date of departure from California.

Sec. 3. By "quarantine" shall be understood the absolute segregation of such animals, on premises provided or approved by the Territorial Veterinarian.

Sec. 4. If at the end of the stipulated period the Territorial Veterinarian is not satisfied that the animals are free from glanders or other contagious diseases, the same shall be either subjected to the mallein test or continued in quarantine, or both, until released and admitted to this Territory.

Sec. 5. All expenses in connection with the quarantining of horse stock as above specified shall be borne by the owner, importer or consignee.

#### **RULE V.—CATTLE FOR BREEDING AND DAIRY PURPOSES.**

Sec. 1. All cattle six months old or over intended for importation into the Territory of Hawaii must be accompanied by a certificate of health issued or approved by a veterinary officer of the United States Bureau of Animal Industry or by the State Veterinarian for the state or district where the cattle in question are located, to the effect (a) that the animals are free from bovine tuberculosis as proved by the tuberculin test and (b) that they have not been in contact, directly or indirectly, with any cattle not proven by the tuberculin test to have been free from tuberculosis for at least one year prior to date of shipment.

Sec. 2. All cattle conforming with "a" of Sec 1, but failing to qualify for "b" may be landed in quarantine and held for re-test and further disposal by the Territorial Veterinarian, as by law provided for animals that have been exposed to infection.

Sec. 3. Calves less than six months old and not accompanying their dams must be accompanied by a certificate issued or approved as in Sec. 1 described, and to the effect that they come from tuberculin tested mothers and have not been exposed to the infection of tuberculosis since birth. Otherwise they shall be dealt with as in Sec. 2 provided for.

#### **RULE VI.—SHEEP.**

No sheep shall be admitted to this Territory unless accompanied by a certificate of health issued or approved by an officer of the United States Bureau of Animal Industry, and to the special effect that the animals are free from sheep scab and have been shipped in accordance with the regulations of the United States Bureau of Animal Industry governing the transportation of live stock in interstate trade.

#### **RULE VII.—SWINE.**

Sec. 1. All swine intended for shipment to the Territory of Hawaii must be accompanied by a certificate of health issued or approved by an officer of the United States Bureau of Animal Industry or by the State Veterinarian, to the effect that the animals have passed a careful veterinary inspection and are free from any indication of disease, and that neither hog cholera nor swine plague has existed within a radius of 5 miles of the premises on which they have been kept for a period of six months immediately preceding the date of shipment.

Sec. 2. The owner or importer must present an affidavit to the effect that the said certificate refers to the swine in question, that the same have been shipped from the premises mentioned in said certificate in



clean and disinfected cars, without unloading and that they have not been submitted to the serum simultaneous or double treatment for hog cholera within thirty days prior to shipment.

Sec. 3. Swine arriving in the Territory without such certificate and affidavit shall be subject to a quarantine of two weeks at the expense of the owner or importer.

### **RULE VIII.—DOGS.**

Sec. 1. All dogs arriving in the Territory of Hawaii and coming from or through any country, state or territory where rabies is known to exist, shall be kept in quarantine, on premises provided by this Board, for a period of 120 days, or for such longer period, not to exceed 180 days, counting from the date of embarkation as, in the judgment of the Territorial Veterinarian, shall be necessary.

Sec. 2. Dogs belonging to tourists or temporary visitors shall be taken to the quarantine station and held there until the departure of the tourist or visitor, when the dog will be delivered on board by the Territorial Veterinarian, all expenses to be paid by the owner, agent or keeper.

Sec. 3. It shall be the duty of the owner, master or agent of any vessel arriving in the Territory of Hawaii to immediately notify the Territorial Veterinarian of the presence on board of any dog, whether intended for disembarkation here or not. Such dog must, in the discretion of the Territorial Veterinarian, be removed to the animal quarantine station or confined on board in such a manner as to insure that it does not come in contact with any other dogs or animals which might transmit the disease of rabies.

Dogs which belong to steamers or other vessels, their officers or crew, or other dogs on board such vessels destined for a further port, must be securely confined as directed by the Territorial Veterinarian as long as the steamer or vessel remains in port. No other dogs shall be allowed on board unless intended for exportation, in which case they shall remain on board when once brought there, and must be confined in the same manner as above described.

Sec. 4. Until further notice the port of Honolulu shall constitute the only port through which dogs may enter into the Territory. Dogs arriving at any other port must be kept confined on board until arrival at Honolulu, or must depart with the vessel when it leaves the Territory.

Sec. 5. All expenses in connection with the quarantining of dogs entering the Territory must be borne by the owner, agent, keeper, or consignees and no dog shall be released from quarantine until such costs are paid.

### **RULE IX—POULTRY.**

All live poultry arriving in the Territory shall be held for inspection and be declared on the list of live stock furnished the inspecting officer on the arrival of any steamer or vessel in the Territory. The number of deaths or cases of sickness and causes thereof, while en route, shall also be noted. Until inspected and passed by the territorial Veterinarian all such poultry must remain on board or be kept confined on the pier awaiting his arrival.

### **RULE X.—WILD ANIMALS, PETS, MENAGERY AND ZOOLOGICAL GARDEN ANIMALS.**

The traffic in this class of animals is regulated by the United States Department of Agriculture, but the Territorial Veterinarian must be notified of the arrival of all such specimens as it is possible for them to carry diseases transmissible to domestic animals and man.



These rules shall take effect upon approval by the Governor.  
APPROVED this 8th day of June, 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

Honolulu, T. H.

# **LAWS UPON WHICH THE FOREGOING REGULATIONS ARE BASED.**

Extracts from Chapter 37, Revised Laws of Hawaii of 1915, as amended by Section 8 of Act 136 of the Session Laws of 1915.

“Sec. 503. RULES AND REGULATIONS. Said board of agriculture and forestry shall have power and authority to make rules and regulations, and to amend the same from time to time in its discretion, subject to the approval of the governor, for and concerning the inspection, quarantine, disinfection or destruction, either upon introduction into the Territory, or at any time or place within the Territory, of animals and the premises and effects used in connection with such animals. Included therein may be rules and regulations governing the transportation of animals between the different islands of the Territory and along the highways thereof, and also such rules and regulations as may be approved by the governor requiring the owners and masters of any boat or vessel engaged in inter-island transportation of live stock, and the managers and agents of railway companies carrying live stock within the Territory, to make reports of the number and class of live stock carried, names of owners and consignees, the places to and from which such stock is shipped, the manner of handling such live stock, the number of deaths or injuries to live stock occurring in transit or while being loaded or unloaded, with the causes of such deaths or injuries and all other matters which may be deemed necessary by the board for a full and complete record of such shipping and handling of live stock. And also to prohibit the importation into the Territory from any foreign country, or other parts of the United States, or from one island within the Territory to another island therein, or to one locality from another locality on the same island of animals known to be infected with a contagious, infectious or communicable disease or known to have been exposed to any such disease.

“Sec. 504. TERRITORIAL VETERINARIAN. Said board of agriculture and forestry shall have power and authority to appoint a superintendent of animal industry who shall be a competent veterinary surgeon and shall be known as the ‘Territorial veterinarian’.

“He shall have charge, direction and control (subject to the direction and control of the board), of all matters relating to the inspection of animals and the prevention and eradication of contagious, infectious and communicable diseases among animals and of all matters relating to animal industry mentioned in or coming within the scope of this chapter, and such other matters as the board shall from time to time direct. He shall enjoy all the powers, rights, privileges and immunities of an officer of the board of health.

“Sec. 505. LIVE STOCK INSPECTORS. Said board of agriculture and forestry shall have power and authority to appoint and commission one or more live stock inspectors for each judicial circuit and other employees as may be necessary for the proper carrying into effect of the provisions of this chapter and may at its pleasure remove any inspector or employee and fix their compensation.

“Sec. 506. ENTRY OF ANIMALS. No domestic animal shall be allowed to enter the Territory of Hawaii except after inspection by the Territorial veterinarian or in his absence by a live stock inspector, and a permit issued by such inspecting officer to the consignee or owner, *provided*, however, that no fees for inspection shall be charged, nor delays caused concerning the landing of any domestic animal for which a certificate of health has been issued as prescribed by an act of con-

gress approved February 2nd, 1903, and entitled "An act to enable the secretary of agriculture to more effectually suppress and prevent the spread of infectious and contagious diseases of live stock and for other purposes'.

"Sec. 507. **LANDING NOT AN ENTRY.** The landing of any animal for the purpose of inspection or quarantine shall not be construed to be an entry into the Territory for any purpose whatsoever, except as herein provided, and if in the opinion of the inspecting officer it shall be necessary or proper to quarantine any such animal, he shall have authority so to do at the expense of the owner or consignee.

"Sec. 508. **QUARANTINE.** The board shall have the power to quarantine any domestic animal known to be affected with or to have been exposed to any contagious, infectious or communicable disease, and to destroy the same, when in the opinion of the territorial veterinarian, or in his absence, a duly qualified veterinary surgeon, such measure is necessary to prevent the spread of such disease, and to provide for the proper disposition of its hide and carcass; and to disinfect premises where any such disease may have existed.

"Sec. 509. **MASTER OF VESSEL TO NOTIFY INSPECTORS.** The master of any vessel on which there shall have been shipped live animals for any port in this Territory shall immediately, upon arrival, cause the inspecting officers to be notified, and shall not permit the animals to be taken from the wharf or landing, nor any portion of the food or water, nor any effects connected therewith or provided for their use during the voyage, to be removed from the wharf or landing until the inspecting officer shall have inspected and passed the same."

#### COMMISSIONERS.

Arthur H. Rice, *President.*

J. M. Dowsett

W. M. Giffard.

H. M. Von Holt

A. L. C. Atkinson.

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C. S. Judd, *Executive Officer*

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#### DIVISION OF ANIMAL INDUSTRY

Victor A. Nørgaard, *Superintendent and Territorial Veterinarian.*

Leonard N. Case, *Assistant Territorial Veterinarian.*

H. B. Elliot, *Deputy Territorial Veterinarian, East Hawaii.*

A. R. Rowat, *Deputy Territorial Veterinarian, West Hawaii.*

J. C. Fitzgerald, *Deputy Territorial Veterinarian, Maui.*

Cyril Golding, *Deputy Territorial Veterinarian, Kauai.*

Joseph Richard, *Livestock Inspector.*

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G. H. Robertson, Vice-Pres.  
E. A. R. Ross, Secretary  
C. C. Rhodes, Auditor

A. Gartley, Vice-President and  
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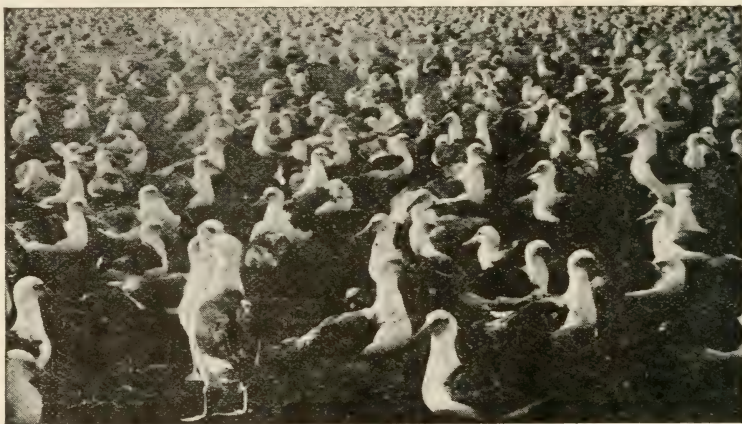
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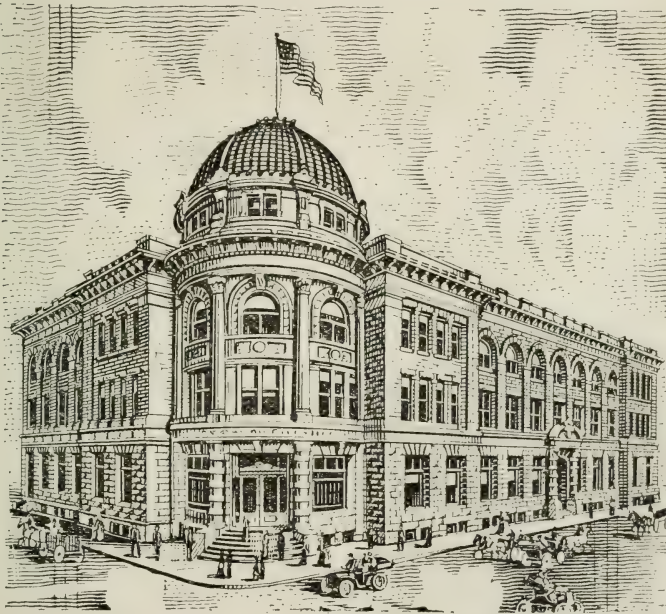


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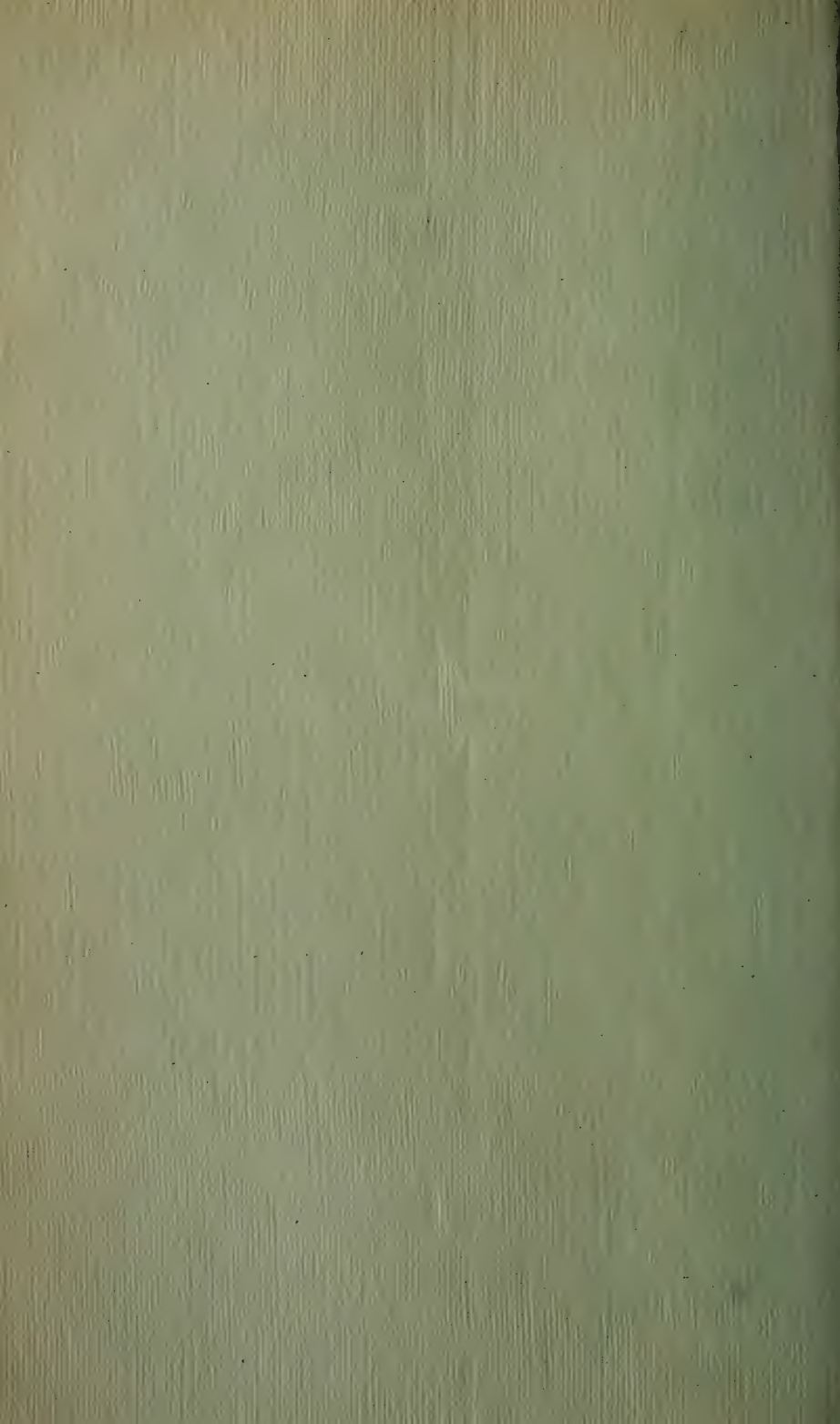
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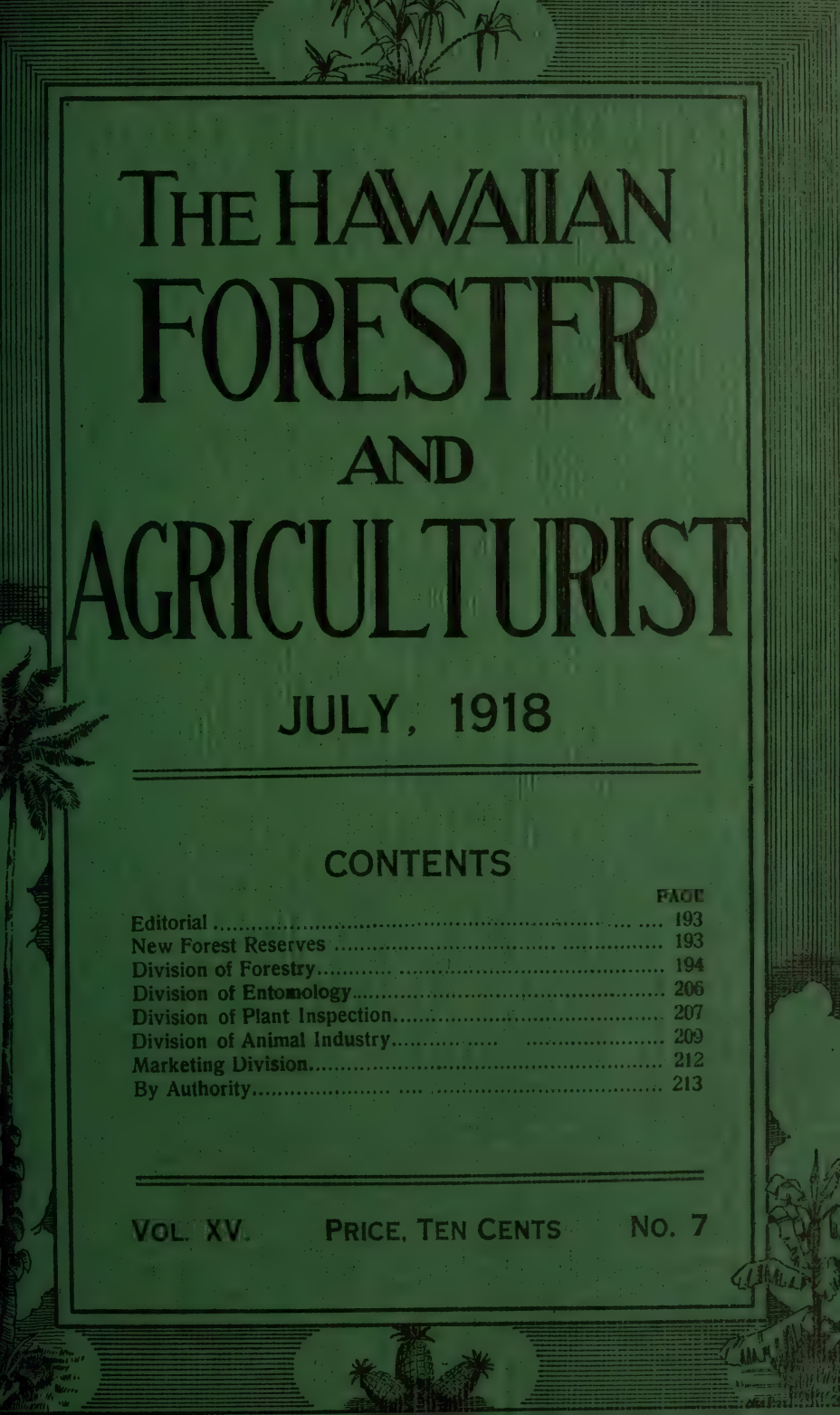
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

JULY, 1918

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All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
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Entomologist.

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Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

HONOLULU, JULY, 1918.

No. 7

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As set forth by the reports and proclamations printed in this issue, progress is being made in winding up the work of setting apart forest lands as forest reserves. With the creating of a few more reserves, data on which are now being assembled, this important Territorial work will be completed and close attention can then be paid to placing these reserves in a condition in which they will serve their greatest usefulness.

By Act 25 of the Special Session of the Legislature, approved by the Governor on May 31, 1918, the Territorial Marketing Division, on July 1, passed out of the control of this Board. Since this latter date the Division has been under the jurisdiction of a Territorial Market Commission appointed by our new Governor.

Strict compliance with the regulations of this Board concerning the importation of live stock into the Territory, especially on the part of the masters and agents of vessels which carry such live stock, is necessary at a time like the present when the Territory can not well allow its food-producing powers to be impaired by the introduction of diseases among its live stock.

A forest ranger from the State of Washington now serving in France with one of the regiments of forest engineers writes that the woods where he is working are full of wild hogs, and that in the French forests there is ten times as much game, such as deer, wolves, foxes and pigs, as there was at home.

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## New Forest Reserves.

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Following a public hearing on June 19, 1918, Governor Lucius E. Pinkham on the same day signed proclamations creating on the different islands three new forest reserves, adding an area to an existing reserve, and eliminating small areas from an existing reserve. These were as follows:

PAPAPAHOLAHOA SPRING RESERVE, KAUAI. Area 54 acres. Approved by the Board on January 18, 1918.

WAIHOLE FOREST RESERVE, OAHU. Area 1169 acres. Approved by the Board on April 24, 1918.



KEAUOHANA FOREST RESERVE, HAWAII. Area 272 acres. Approved by the Board on January 18, 1918.

ADDITION TO MAKAWAO FOREST RESERVE, MAUI. Area 263 acres. Approved by the Board on January 18, 1918.

WITHDRAWALS FROM THE HONOLULU WATERSHED FOREST RESERVE, OAHU, for road exchange purposes. Area 1.76 acres. Approved by the Board on April 24, 1918.

The setting apart of these new reserves brings the present total number of forest reserves in the Territory up to 42, with a total area of 773,951 acres, of which 521,557 acres, or 69 per cent., is government land.

According to custom the reports of the Superintendent of Forestry on these individual projects are printed herewith, as are also the Governor's proclamations.

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## Division of Forestry

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### PROPOSED PAPAPAHOLAHOLA SPRING RESERVE, KAUAI.

Honolulu, Hawaii, November 27, 1917.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart as a forest reserve of the government land at Kalaheo, Kauai, formerly known as the Papapaholahola Spring Reservation, consisting of 54.4 acres.

This area was originally reserved, at the time the Kalaheo homesteads were opened for settlement, for the purpose of protecting the original water supply for these homesteads. At the point marked "Spring" on the attached map there is a small reservoir from which there is a pipe extending down to the homesteads supplying them with water for domestic purposes. The county owns the water works and has expended approximately \$20,000 on the system.

At the time this area was originally reserved it was under the jurisdiction of the then Superintendent of Public Works, but on September 25, 1908, he turned the control of this land over to this Board so far as its care and tree planting was concerned. Since then, Mr. Walter D. McBryde, in charge of the sub-nursery of this Board, has consistently planted up the area with trees for water conservation purposes and has cared for them so that today more than three-quarters of the area is well covered with a dense, healthy, young forest.

The setting apart of this land as a regular forest reserve would not interfere in any way with the use of the water which is derived from it, but by making it a permanent forest reserve the preservation and improvement of forest conditions on the water-

shed and the increase of the source of water supply would be fostered.

The present Superintendent of Public Works is heartily in favor of the project of having this land permanently set aside and Mr. McBryde strongly recommends that it be created as a forest reserve.

The area is well protected by a strong fence and the two laborers employed by this Board under the direction of Mr. McBryde are constantly caring for the trees and extending the plantings.

For the reasons set forth above, I recommend that the Board approve the creation of the Papapaholahola Spring Reserve and that the Governor be requested to cause the land to be so set apart.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## WAIHAOLE FOREST RESERVE, OAHU.

Honolulu, Hawaii, April 15, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart as a forest reserve of certain forest lands in the region of Waiahole, District of Koolaupoko, Oahu.

### LANDS INCLUDED.

The area proposed to be reserved covers a total of 1,168.55 acres and includes the government forest lands of Makawai at the upper end of the main Waiahole Valley, the private land of Hanakea, and the adjacent government forest lands of Kapikokau and Waianu I to the north. On the north is the private land of Waianu II, on the east or makai side are various private grants and open public land, on the south is the private land of Kaalaea, and the west or mauka boundary is the main Koolau ridge. Various small kuleanas, given in the list at the end of this report, are so situated in the valley bottoms that they could not very well be excluded in describing the boundaries of this proposed reserve which follow the most logical lines on the ground. A technical description, C. S. F. 2906, has been supplied by the survey office and the boundaries of this reserve are shown in red on the attached blue print map.

### FOREST DESCRIPTION.

The upper Waiahole and Waianu valleys are typical of the

windward forests of Oahu. The cliffs, steep slopes, gentle reaches and valley bottoms are densely clothed with the usual wet-forest cover consisting of not only the indigenous native trees such as koa, ohia lehua, kukui, ohia ai, etc., but also of vines, ferns, undergrowth, and mosses. The value of such a cover for holding the run-off and conserving the fallen rain is too well known to need further comment here, and it is especially important that it be protected and kept intact in this region because of the high value of the pure mountain water which emanates from it in various springs and streams.

#### PAST HISTORY.

Along the makai boundary of the proposed reserve there has been some damage done to the edge of the forest in the past by cattle with the result that the lower native forest is partly gone and has been replaced to a small extent by Hilo grass and guava.

Charcoal burners have also trespassed on the land and cut the large guava trees in the main Waiahole Valley until very recently when I stopped all operations and referred the matter to the Commissioner of Public Lands for prosecution. The practice of removing any trees here tends to favor the spread of Hilo grass to the detriment of the indigenous trees and undergrowth and must be absolutely prohibited.

The object, therefore, of this reserve is to put it under proper forest administration and protection so that all damage by stock and man will be prevented and the native forest made to serve its function of conserving the water. One of the first steps along this line will be the building of a stock-proof fence on the makai boundary of this reserve to keep out the cattle which now run at large in Waiahole Valley.

#### WAIAHOLE TUNNEL.

Waiahole is probably best known on account of the tunnel which has been constructed at the head of the valley to take local water and water from as far as Kahana Valley through the Koolau Range to the cane fields in the Ewa basin. This was begun in January, 1913, and completed in May, 1916, at a cost of approximately \$2,300,000, and it is the largest hydraulic engineering project ever completed in the Territory. The north portal of this main tunnel, which is 2.76 miles long, is 750 feet above sea level. The side tunnels which bring water from Kahana, Waikane, Waianu and Waiahole valleys have a total length of 4.66 miles.

The construction and operating of this tunnel on government land was authorized on December 14, 1912, by water license No. 810 to the Waiahole Water Co., Ltd., issued by the Commissioner of Public Lands. This license among other things authorizes the company to take the government water from Waiahole and Waianu valleys for which it pays the Territory annually \$15,000

for the first 30 years, and thereafter at reappraised rates to be adjusted every 10 years, up to a maximum period of 60 years. The company is allowed to take rock and other material, to establish camps and to open and maintain necessary roads and trails, and the creation of the reserve will naturally be subject to the existing rights granted by this license.

It will, therefore, be seen that besides the usual reason for protecting this forest for the conservation of water for general use, there is a special reason, on account of the sale of this pure mountain water which brings in a large annual income to the Territory.

#### OWNERSHIP OF LAND.

The total area proposed to be reserved is 1168.55 acres, of which 1128.63 acres, or 96.5%, is government land, as follows:

Name of Land	Owner	Acreage
Makawai . . . . .	Territory of Hawaii...	888.75
Kapikokau . . . . .	Territory of Hawaii...	53.70
Ili of Waianu I. . . . .	Territory of Hawaii...	186.18
L. C. A. 7656, Apanas 1, 2 & 3, Makawai..	L. L. McCandless.....	3.25
L. C. A. 10625, Apanas 1 & 2, Makawai...	L. L. McCandless.....	1.11
L. C. A. 8787B, Apana 2, Makawai.....	L. L. McCandless.....	.89
L. C. A. 8052, Apana 3, Waianu I. . . . .	{ L. L. McCandless.. $\frac{1}{2}$ }	1.00
	{ Jas. Cullen ..... $\frac{1}{2}$ }	
L. C. A. 7659, portion of Waianu I. . . . .	{ D. H. Lani..... $\frac{1}{3}$ }	1.62
	{ Kalani Lani ..... $\frac{1}{3}$ }	
L. C. A. 8603, Mahele 2, Ili of Hanakea..	L. L. McCandless.....	32.05
Total area. . . . .		1,168.55

#### RECOMMENDATION.

For the reasons above set forth, I recommend that the Board approve the project of creating the Waiahole Forest Reserve, as described above, and that the Governor be requested to take the necessary steps toward this end.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

#### PROPOSED KEAUOHANA FOREST RESERVE, PUNA, HAWAII.

Honolulu, Hawaii, November 27, 1917.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart as a forest reserve of a portion of the government land of



Keauohana, Puna, Hawaii, consisting of a net area of 271.60 acres.

This is an area of dense forest land near the junction of the Upper Puna road and the road that turns off to go down to Kalapana and is north of and adjacent to the Kikala-Keokea homesteads. The forest consists of tall, slim ohia lehua trees on the straight trunks of which delicate ieie vines are entwined and is one of the most charming spots that greets the eye of the traveler along the road to Kalapana.

This land, along with the adjacent lands of Kehena and Keekee, had early in the year been advertised for a general lease, but on the protest of some of the Hilo residents, who feared that such a lease would result in the destruction of this forest if cattle were allowed to run in it or the trees cut down to allow the growing of awa, and pointed out the advisability of retaining this particular piece of native forest intact along the road, the Commissioner of Public Lands referred the matter to me with the suggestion that the heavily forested part be created a forest reserve.

In addition to its attractive scenic value the retention of this forest and its protection is very advisable on account of the general beneficial effect which this forest exerts on the rainfall in this region where the inhabitants depend upon the rain for their supply of domestic water.

In running out the boundaries of this reserve the outer limits have been extended sufficiently so that any destruction which may take place outside of the area will not have a detrimental influence on the forest desired to be protected.

In leasing any adjacent land the Commissioner of Public Lands has agreed to insert suitable clauses in the lease which will require the lessee to construct a stock-proof fence along whatever boundaries of the area are in need of protection.

The Division of Forestry is in the best position to give this forest the necessary care and protection and since it is advisable to retain it intact, for the reasons given above, I recommend that the Board approve the creation of the Keauohana Forest Reserve and that the Governor be requested to cause the land to be so set apart.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

---

PROPOSED ADDITION TO MAKAWAO FOREST RESERVE, MAUI.

Honolulu, Hawaii, January 11, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :—I have the honor to recommend that an area of 263 acres of government land be added to the present Makawao

Forest Reserve on Maui. This area, as shown by the red lines on the attached blue print map, is adjacent to and makai of the present Makawao Reserve which was set aside on April 21, 1908, and consists of the balance of the government land in the Piiholo section of the Haleakala tract.

The government land to the southwest has been surveyed into lots and will shortly be opened up for homestead entry. The boundary between the homesteads and this proposed addition is the Kahakapao gulch, which is a deep, well forested gulch, and forms for the most part a natural barrier between these two lands. At the northwest end of this tract the boundary runs along a private grant. The land of Haiku to the northeast is privately owned and is separated from this proposed addition by the Waiohiwi stream, the banks of which form in places a natural barrier to stock.

The forest on this remnant of government land consists of koa and kukui along the steep gulches and ohia lehua on the gulch slopes. On the tops of the flat ridges within the tract the forest is more open on account of wood cutting and grazing in past years and consists of halapepe and olopua trees interspersed with the waiawi guava. The forest on this addition can readily be protected by the construction of short stretches of fences where natural barriers do not exist and since this area is a natural part of the adjacent land already set aside, it is well worth while to prevent further forest destruction and include it with the other lands which have already been reserved in this region for the purpose of water conservation.

For these reasons I recommend that the Board approve the creation of this addition of 263 acres to the Makawao Forest Reserve and that the Governor be requested to cause the land to be so set apart.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

#### WITHDRAWAL OF LAND FROM HONOLULU WATERSHED FOREST RESERVE.

Honolulu, Hawaii, November 27, 1917.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to submit as follows, a report recommending the withdrawal of four small parcels of land on Tantalus Heights from the Honolulu Watershed Forest Reserve, Oahu.

These four parcels of land, aggregating 4.19 acres, are desired

by the Territory as the basis of exchange for other lands needed by the government and this recommendation is made at the request of the Commissioner of Public Lands which is contained in the attached copies of correspondence.

The four parcels of land desired to be withdrawn from the Honolulu Watershed Forest Reserve, and returned to the jurisdiction of the Land Commissioner for exchange purposes, are as follows:

1. *Lot 1, to Trustees H. P. Baldwin Estate. Area 1.52 Acres.*

This is situated just within the boundary of the Honolulu Watershed Forest Reserve, east of Sugar Loaf, between the new Round Top road and the edge of the Manoa Valley cliffs. It is open land covered with Hilo grass and scrub guava. This is part of an area which has been granted in exchange for land that was used in the construction of the Round Top road and its withdrawal from the reserve is now requested in order to clear up the records.

2. *Lot 2, to Trustees H. P. Baldwin Estate. Area 0.137 Acre.*

This is a very small area within the same reserve northeast of Sugar Loaf adjacent to the present new road which was granted in exchange for land that was needed by the Territory in the construction of the Round Top road and its withdrawal now is requested for the same reason given above.

3. *Unnumbered lot. Frear Exchange. Area 0.103 Acre.*

This is an area of only 4485 square feet at the turn of the Round Top road near the corner of Grant 4577 to W. F. Frear. It is on a bank at the edge of the cliff and is only open grass land. The Land Commissioner desires to use this as a basis of exchange for a piece of land of approximately equal area in the above grant which was taken and used in the construction of the new road.

- \* 4. *Lot 7B. Swanzy Exchange. Area 2.43 Acres.*

This is an area further mauka between the top of Tantalus and Manoa cliffs adjacent to Lot 7A, Grant 4864, to E. H. Wodehouse. The northwest portion of this lot is open land covered with Hilo grass and guava bushes, while the eastern portion, covered with native forest trees, is a narrow sloping strip adjacent to the Manoa cliffs and surrounded on all sides by privately owned land. No portion of this lot is needed for administrative purposes and its withdrawal will not be a detriment to the reserve, surrounded as it is by private land on all but the northwest side. This area of 2.43 acres is desired by the Land Com-

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\* Not approved by the Board.

missioner to be used along with 37.57 acres of government land (not in a forest reserve) on Hawaii in exchange for 40 acres of land at Kaaawa, Oahu, belonging to Mrs. F. M. Swanzy which the U. S. Army desires to acquire for camping purposes.

Blue print diagrams of these four lots are herewith attached.

Since these parcels of land are needed for perfecting government exchanges of land and their withdrawal from the Honolulu Watershed Forest Reserve will not be a detriment to the reserve nor have any influence on existing watercourses, I recommend that the Board approve their withdrawal and that the Governor be requested to take the necessary further action to perfect this.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

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## REPORT FOR MAY.

Honolulu, Hawaii, June 15, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of May, 1918:

### PROPOSED MOKULEIA FOREST RESERVE.

During the first part of the month I spent seven days on the north slope of the Waianae Range, back of Mokuleia, Oahu, with government surveyors and completed the field work on the proposed new forest reserve in this region which consists of 6290 acres of unleased government forest land. This work consisted of locating on the ground the north line of the reserve which stretches from the Kuaokala Reserve near Kaena Point for a distance of about 7.37 miles over very rough country to Puu Pane on the boundary of the United States Military Reservation of Waianae-uka, and of placing 19 forest reserve monument pipes with flags at prominent points on the boundary line which abuts private land. Owing to the presence of dairy and ranch cattle which wander at large on the government forest land with destructive results, it will be necessary to construct, by arrangement with the cattle owners, a fence approximately five miles long on this marked boundary. The area to be included in the reserve is important as a conservator of water which is necessary for the agricultural crops on the lower lands below. Here are located one of the largest banana producing sections in the islands, and large areas of rice and sugar cane, all of which are irrigated by water from 21 wells sunk into the artesian basin



which depends upon this mountain slope for its supply of water. A full report on this new reserve with recommendations for setting it apart will be submitted at an early date.

#### OTHER NEW RESERVES.

During the month an examination was also made of 103.85 acres of vacant unleased government land adjacent to the present reserve in Makua Valley, Oahu, which it is proposed to add to the forest reserve. This project had already been presented to and approved by you and now awaits a public hearing to be held in the near future.

The other five new forest reserve projects, mentioned in my last report, which have already received your approval, will be considered at a public hearing to be held at the Government Nursery on Wednesday, June 19, at 9 o'clock a. m., published notice of which, signed by the Governor, is now running in the daily papers.

#### INSPECTION OF WAIANAE FOREST RESERVES.

From May 20 to 22 I made a three-day inspection of the four forest reserves on the lee slope of the Waianae range, Oahu, in company with Ranger Pililaau. As a result of this trip, a special report on the need of reforestation in these reserves, which includes the plan of beginning the work by the establishment of a forest nursery at Mikilua in the Lualualei Reserve, has already been submitted to you and has already received your approval. Other matters investigated during the same trip were as follows:

In the Nanakuli Reserve the fence on the forest boundary built last summer by lease requirement was found to be in good condition except at one point at the head of the valley where it was not stock-proof because of loose wires and where an obstruction of bars in the stream bottom had broken down. A flock of at least 30 goats was also observed in the forest reserve. Both of these matters were called to the attention of the Land Commissioner so that he could take them up with the holder of the lease which requires the fence to be maintained in stock-proof condition and the goats to be kept out of the reserve.

In the Lualualei Reserve I found the fence on the boundary all in good stock-proof condition with no cattle within the reserve. The beneficial results of keeping cattle out are already showing in the increased growth of native trees and in several of the smaller valleys abundant streams were flowing. In fact the supply of water is sufficient to justify the laying of several miles of large pipe, on the part of the adjacent land owner, to watering troughs in the Lualualei Valley.

In the Waianae-kai Forest Reserve conditions are excellent and the benefits of protection against stock, coupled with the tree planting that has been done there in past years, are very apparent with the result that floods have been greatly lessened and the

small streams now run more continuously throughout the year. In order to keep out of the forest the Geo. Holt cattle which swarm over the highways in this region and occasionally break through the side fences along the old road within the reserve, a stretch of about 1200 feet of fence will soon be constructed on the lower reserve boundary with a gate across the road at the power house, permission for the construction of which has already been granted by the Board of Supervisors.

On a visit to Makaha Valley the private forest reserve, fenced within the year to keep cattle out of the native forest, was viewed with great satisfaction.

An inspection of the Makua-Keaau Reserve disclosed the same conditions which were found on a similar inspection made over a year ago, viz., the fence on the forest reserve boundary required to be built by the holder of General Lease No. 730 has not yet been constructed and cattle are free to wander at will into the native forest with destructive results. This condition has already been reported to you and appropriate action to correct it has been taken.

Several hours were spent in designating for thinning algaroba trees, on unreserved government land near Waianae village under a license issued by the Land Office. This was done by selecting and marking the best trees which are to remain uncut.

An inspection was also made of similar cuttings on government land in Lualualei near the sea, and the only unsatisfactory condition found here was the dangerous accumulation of large, dry brush piles near the trees to be left standing. The matter has been called to the attention of the Land Commissioner with the suggestion that the brush be removed to more open places before burning, and that in future cuttings the brush be burned green over small hot fires of dry wood. The suggestion was also made to the Land Commissioner that in future algaroba licenses a higher stumpage price than \$2.50 to \$2.75 per cord, the present rates, be charged. The present rates allow an unreasonable profit to the licensee and it would appear only just that the government receive the benefit of the present market price from wood in this region where private algaroba stumpage has sold as high as \$8.00 per cord.

#### FOREST FENCING.

The fence at the northwest corner of the Hilo Forest Reserve, Hawaii, which has been constructed in coöperation with the Kukaiau Ranch to keep cattle out of the government forest reserve lands of Piha and Laupahoehoe and which is 6.20 miles in length, was completed on May 9, and will be inspected on my next trip to Hawaii. During the past 18 months over 30 head of wild cattle have been removed, either by roping or shooting, from this part of the reserve.

Upon the receipt of a report from Ranger Lovell that the

fence along a part of the Moloaa Forest Reserve boundary was out of repair and cattle were continually getting into the reserve from the adjacent leased government land, the Land Commissioner was requested to notify the holder of General Lease No. 792 to put the fence into stock-proof condition at once.

#### FOREST PLANTING.

During the month the planting gang in Makiki set out 240 koa trees and also planted one acre in the lower valley, next to the mahogany plantation, with yellow poinciana, *Peltophorum inerme*, an excellent hardwood tree whose growing abilities under the close spacing of 8 by 8 feet it is desired to ascertain.

The planting gang in Manoa Valley completed the reforestation of all open government forest reserve lands in the valley by setting out 1253 koa trees during the month. During June the men will clean up around all planted trees and early in July will move to the Waianae region to start the reforestation work there under the plan already approved by you.

#### MISCELLANEOUS.

On May 25, I visited the island of Kapapa on the Kaneohe Bay outer reef and set up a painted wooden sign bearing in the English, Hawaiian and Japanese languages the gist of Rule IV of this Division covering the protection of animal and bird life. On the same day I also planted on the island two sprouted coconuts, 5 milo trees and 9 ironwoods, and sowed several pounds of milo seed.

Toward the end of the month I issued to Mr. C. H. Bellina a temporary permit to cut honohono and panicum grass from the lower part of the reserve in Nuuanu Valley below the reservoir and the area restricted by Rule III on the understanding that in return he would construct the fence on the forest reserve boundary at Kuliouou which is required by the terms of General Lease No. 837 which he holds.

On May 6, I delivered a paper on "Forestry as Applied in Hawaii" before the Social Science Association of Honolulu. This will appear in the June "Forester," and also as a reprint on the recommendation of this Association and with the consent of the President of this Board, because of the many propagandistic facts in favor of forestry which it contains and which should be made generally known.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, June 28, 1918.

Superintendent of Forestry, Honolulu, T. H.

SIR:—I herewith submit a report of the principal work done during the month of May:

## NURSERY.

*Distribution of Plants.*

Sold . . . . .	170	pot grown plants.
Gratis . . . . .	1,050	transplants in boxes.
“ . . . . .	285	pot grown plants.
<hr/>		
Total . . . . .	1,505	plants.

## COLLECTIONS.

On account of plants sold . . . . .	\$ 5.70
Rent of Office Building, Nursery Grounds, for March . . . . .	35.00
<hr/>	
Total . . . . .	\$40.70

## PLANTATION COMPANIES AND OTHER CORPORATIONS.

The distribution of trees under this heading amounted to 1000 in seed boxes and 200 pot grown, total 1200.

## MAKIKI STATION.

The work done at this station has been principally routine. We are now busy getting ready to propagate large quantities of trees for the coming planting season.

## HONOLULU WATERSHED PLANTING.

In Makiki main valley we planted 686 *Peltophorum inerme* and 240 koa. The *Peltophorums* were planted on lower side of mahogany grove on mauka side.

## ADVICE AND ASSISTANCE.

The writer has been called upon to give advice and assistance as follows: Calls made, 9; advice given by telephone, 6; advice by letter, 4; advice given at Nursery, 8.

Respectfully submitted,

DAVID HAUGHS,

Forest Nurseryman.



# Division of Entomology

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Honolulu, Hawaii, June 13, 1918.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

GENTLEMEN:—During the month of May the insectary handled 30,300 pupae of the melon fly, from which there were bred 925 females and 744 males *Opius fletcheri*.

The distribution of parasites was as follows:

## *Opius humilis.*

	<i>Females</i>	<i>Males</i>
Oahu:		
Honolulu . . . . .	60	25
Manoa . . . . .	55	20
Kaimuki . . . . .	12	8
Wahiawa . . . . .	20	14

## *Diachasma tryoni.*

Oahu:		
Honolulu . . . . .	130	45
Kaimuki . . . . .	170	85
Manoa . . . . .	42	14
Wahiawa . . . . .	35	10

## *Diachasma fullawayi.*

Oahu:		
Kaimuki . . . . .	60	44
Manoa . . . . .	28	16
Wahiawa . . . . .	40	27

## *Spalangia cameroni.*

Maui:		
Haiku . . . . .	..	50
Paia . . . . .	..	1000

## *Opius fletcheri.*

Oahu:		
Kaimuki . . . . .	110	104
Moanalua . . . . .	447	318
Wahiawa . . . . .	102	101

## *Galesus silvestri.*

Hawaii:		
Glenwood . . . . .	..	150

*Paranagrus osborni.*

Oahu:		
Kailua . . . . .	...	600
Makiki Nursery . . . . .	..	5800
Kaimuki . . . . .	..	400
Maui:		
Paia . . . . .	..	700
Haiku . . . . .	..	6300
Hawaii:		
Kau . . . . .	..	500
Parker Ranch . . . . .	..	500

Respectfully submitted,

DAVID FULLAWAY,  
Entomologist.

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## Division of Plant Inspection

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Honolulu, Hawaii, May 31, 1918.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of May, 1918, as follows:

During the month there arrived at the port of Honolulu 44 vessels, of which 18 carried vegetable matter with the following results:

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	382	9421
Fumigated . . . . .	20	48
Burned . . . . .	41	41
Returned . . . . .	4	4
Total inspected.....	477	9514

Of these shipments 9,339 packages arrived as freight, 97 packages as mail and 78 packages as baggage.

### RICE AND BEAN SHIPMENTS.

During the month 60,177 bags of rice and 975 bags of beans

arrived from Japan and Oriental ports, and with the exception of 15 bags of Chinese rice, which was fumigated for an infestation of the larvae of a moth, *Paralipsca modesta*, all was found free from pests.

#### PESTS INTERCEPTED.

Approximately 5243 pieces of foreign baggage of passengers from foreign countries were examined and from these were seized and destroyed by burning 22 lots of fruit and 19 lots of vegetables.

The following disposal was made of seeds and plants from various sources:

On May 6, a package of rice paddy in the mail from Manila was fumigated for an infestation of weevils.

On May 14, a package of cotton seed in the baggage of an immigrant from Manila was burned.

On May 16, six ornamental plants in the baggage from Japan was fumigated for an infestation of ants.

On the same date six plants in the baggage from Japan were fumigated as a precaution and released. Also 15 bags of Chinese rice were fumigated for an infestation of *Paralipsca modesta*.

On May 20, six boxwood trees from California were found infested with the boxwood payllid, and fumigated before delivery.

On May 30, ants were found in the soil on the roots of eleven maple trees in the baggage from Japan. These were fumigated and the soil removed.

On the same date two ornamental trees in the baggage from Japan were fumigated as a precaution.

The following were returned by the post office as unmailable: May 6, one package of palm nuts from Manila. May 13, a parcel of "chiotes" from Sydney. May 16, a package of cuttings from Manila. May 28, one package of violet plants from Sydney.

#### HILO INSPECTION.

Brother M. Newell reports the arrival of five steamers, two of which carried vegetable matter consisting of 82 lots and 1890 parcels, all of which were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Will J. Cooper, Plant and Fruit Inspector for Maui, reports the arrival of five vessels at the port of Kahului, three of which brought vegetable matter, consisting of 50 lots and 657 packages, all of which were found to be free from pests.

#### INTER-ISLAND INSPECTION.

Sixty-one steamers plying between Honolulu and other island

ports were attended, and the following shipments were passed as free from pests:

Taro . . . . .	782	bags
Vegetables . . . . .	197	packages
Plants . . . . .	184	packages
Pineapples . . . . .	16	crates
<hr/>		
Total passed . . . . .	1179	packages
Refused . . . . .	7	packages
<hr/>		
Total inspected . . . . .	1186	packages

Three packages of plants and four packages of fruit were refused shipment on account of infestation and undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry

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Honolulu, Hawaii, July 8, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of May, 1918.

### RULES AND REGULATIONS.

The revised rules and regulations governing the importation of live stock and other animals into this Territory from the mainland of the United States and from foreign countries, and to which reference was made in my report for April, were referred to the Attorney General for legal approval. After making such corrections as suggested by him, the regulations were approved by this Board at its regular monthly meeting, after which they were referred to the Governor for his approval and signature.

The revision of the regulations pertaining to the control and eradication of diseases of live stock within the Territory is well under way and will be submitted to the Board at an early date.

Considerable annoyance has been experienced during the last few months on account of laxity on the part of certain steam-



ship companies in making their officers or agents comply with the regulations of the Board. Even though these regulations, and especially those pertaining to the importation of live stock from the mainland, can be said to be neither onerous nor difficult of complying with—in most cases resolving themselves into advising the prospective shipper of live stock to get into communication with the office of the federal Bureau of Animal Industry—a number of omissions have occurred, in somewhat quick succession, which, were it not for the multiplicity of restrictions engendered by war, could not be tolerated. The Territory cannot be served by having its food-producing powers impaired by the introduction of diseases among its live stock, especially when it can be avoided by complying with the Board's regulations, and when these regulations do not call for the expenditure of one cent on the part of the carrier, beyond the cost of a call to the federal office in question, and that call, whether by telephone or in person, can be made to devolve upon the shipper. The whole problem revolves itself, in so far as the carrier is concerned, into refusing to accept shipments of his stock until the consigner has complied with the regulations of this Board; and to emphasize such compliance the carrier need only refer to the \$500.00 penalty which attaches to the carrying of live stock or other animals to this Territory in contravention of the rules aforesaid, and for which the Territory will hold the carrier responsible. When, therefore, repeated omissions, some of which have caused this office serious embarrassment, have recently occurred, the revision of the rules and regulations in question is confidently expected to obviate recurrences of the same nature, as the revised edition emphasizes the duties of the carrier.

The printing and distribution of these regulations in a sufficient number to allow the carriers to provide them freely to all shippers of live stock to these islands is therefore recommended as an economical measure in the enforcement of the territorial statutes which impose on this Board the exclusion of diseased live stock.

#### ANTHRAX CONTROL WORK ON KAUAI.

Since August of last year only two cases of anthrax have occurred on Kauai. One, a mule, died during February, and the other, a horse, on the ninth of this month. Both cases occurred in the stable pasture of the Princeville Plantation Company, a small enclosure where the work animals are kept and where one of the vaccinating chutes is located. This enclosure became heavily infected during the outbreak last summer, but as all cases were burned where they fell, and as all the work animals have been repeatedly vaccinated, it was considered safe to continue its use. When, however, the second case occurred, all stock was removed and revaccinated. When recently in Hono-

lulu, the manager assured me that not alone the enclosure in question, but also the surrounding paddocks, would be plowed deeply and planted with a fertilizing crop, which eventually will be turned under, disced, harrowed and again seeded with pasture grass.

Dr. Golding, the deputy territorial veterinarian stationed at Hanalei, reports that he has finished revaccinating all the live stock on the Princeville Plantation as well as the outside animals in the quarantined area including the rice planters' work animals. For this purpose the Board has supplied Dr. Golding with 2400 doses of serum vaccine, in addition to the 600 he had on hand. There now remains at our disposal only the 1000 doses which the Board deposited with the Parker Ranch, and which I have had returned to Honolulu as the time limit for its effectiveness was approaching. Hanalei Valley still remains in quarantine, the four guards—two at either end—being provided by the County of Kauai though in direct charge of Dr. Golding. This continuation of quarantine, enforced by guards, is in my opinion an exaggerated, not to say unnecessary measure, the cost of which, \$3000.00 per annum, might be applied to better advantage by securing the services of Dr. Golding, permanently. Dr. Golding has since January 1st, 1918, acted as deputy territorial veterinarian for the County of Kauai in the place of Dr. A. R. Glaisyer, resigned. It is to be hoped that some arrangement can be made whereby the Kauai Planters' Association can render the same support to Dr. Golding that they have in the past given to our former representative.

A detailed report of the routine work in tuberculin testing and inspection of imported live stock by the Assistant Territorial Veterinarian is herewith appended.

Respectfully submitted,

VICTOR A. NØRGAARD,  
Territorial Veterinarian.

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## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, June 20, 1918.

DR. VICTOR A. NØRGAARD, Chief, Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu, T. H.

SIR:—I have the honor to submit the following report for the month of May, 1918:

### TUBERCULOSIS CONTROL.

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
Chas. Lucas .....	154	152	2

Besides the above, 638 head of cattle were injected with tuberculin for the O. R. & L. Co. Ranch at Kunia, the results of which will appear in the June report.

#### IMPORTATIONS OF LIVE STOCK.

S. S. Lurline, San Francisco: 2 horses, U. S. Q. Dept.; 1 horse, Angus McPhee; 1 dog, O. N. Cronk; 5 crates poultry.

S. S. Shinyo Maru, Orient: 2 monkeys, Dr. S. Yamashiro; 1 cat.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

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## Marketing Division

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Honolulu, Hawaii, June 1, 1918.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

GENTLEMEN:—The sales for the month amounted to \$14,188.-08, which is \$2223.26 more than the sales for the previous month.

A larger number of shipments of beef were received during the month than have been received for some time and a good portion of it was from small shippers on Molokai, Hawaii, and Oahu.

The few shipments of small white beans received from Maui are not selling very fast, as they are not as clean as the beans which are imported. The Maui demonstrator has been instructed to try to get the farmers who have been planting small white beans to plant the Maui Red, or the Calico beans, which are better sellers and easier handled than the small white, with the crude equipment found on most of the small farms on Maui.

Island Irish potatoes are more plentiful than they have been for some time. The island potatoes are smaller than the imported potatoes, but they are in better condition, and are selling for \$2.50 per hundred. The Division is receiving large shipments of sweet potatoes which are being readily sold for very good prices.

Enclosed herewith is a statement of the operations for the month, and a copy of the general trial balance.

Respectfully,

O. B. LIGHTFOOT,  
Acting Superintendent.

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## By Authority

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### PAPAPAHOLAHOLA SPRING RESERVE, KAUAI.

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#### PROCLAMATION OF FOREST RESERVE, DISTRICT OF KONA, ISLAND AND COUNTY OF KAUAI, TERRITORY OF HAWAII.

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Under and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, LUCIUS E. PINKHAM, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby SET APART as a forest reserve to be called the PAPAPAHOLAHOLA SPRING RESERVE, subject to existing rights, a portion of that certain piece of government land called Kalaheo, in the District of Kona, Island and County of Kauai, Territory of Hawaii, containing an area of 54.4 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2378 and "Papapaholahola Spring Res." and a description accompanying the same numbered C. S. F., 1941, which said description now on file in said Survey Department, is as follows:

#### PAPAPAHOLAHOLA SPRING RESERVE,

Kona, Kalaheo, Kauai.

C. S. F. 1941.

Beginning at a + on a stone at the North corner of Lot 88 of the Kalaheo Homesteads, the Northwest corner of Lot 90 and the West corner of Lot 91, from which "Papapaholahola" Government Survey Trig. Station is by true azimuth and distance  $83^{\circ} 13' 300.0$  feet, as shown on Government Survey Registered Map No. 2378, and running by true azimuths:

1.  $235^{\circ} 21'$  426.8 feet along Lot 91 to + on a stone;
2.  $195^{\circ} 57'$  522.7 feet along Lot 91 to + on a stone at road;
3.  $147^{\circ} 18'$  334.6 feet along road to + on a stone;
4.  $149^{\circ} 11'$  175.0 feet along road to + on a stone;
5.  $155^{\circ} 47'$  223.1 feet along road to + on a stone;
6.  $105^{\circ} 24'$  49.1 feet along road to + on a stone;



7. 76° 25' 181.4 feet along road to + on a stone;
8. 82° 51' 205.5 feet along road to + on a stone;
9. 89° 27' 338.8 feet along road to + on a stone;
10. 93° 06' 81.6 feet along road to + on a stone;
11. 156° 57' 249.3 feet along road to + on a stone;
12. 120° 34' 73.9 feet along road to + on a stone;
13. 33° 33' 131.4 feet along road to + on a stone;
14. 39° 55' 93.8 feet along road to + on a stone;
15. 85° 12' 32.0 feet along road to + on a stone;
16. 114° 20' 61.0 feet along road to + on a stone;
17. 151° 44' 54.8 feet along road to + on a stone on the boundary of Kalaheo and Wahiawa;
18. 10° 18' 797.5 feet along Wahiawa to 1½" galvanized iron pipe cemented in large rock called Kapuna;
19. 13° 23' 698.9 feet along Wahiawa to + on a stone on bank of ditch;
20. 283° 40' 240.8 feet along ditch and Lot 9 to + on a stone;
21. 342° 39' 192.6 feet along ditch and Lot 9 to + on a stone at road;
22. 312° 48' 31.2 feet across end of road to + on a stone;
23. 240° 07' 184.6 feet along Lot 87;
24. 261° 23' 605.9 feet up side of Papapaholahola and along Lot 87 to + on a stone;
25. 303° 08' 63.2 feet along Lot 87 to + on a stone;
26. 254° 47' 290.4 feet along Lot 88 to the point of beginning.

AREA, 54.4 Acres.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.  
(SEAL) DONE at the Capitol, in Honolulu, this 19th day of June, A. D. 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

By the Governor:

CURTIS P. IAUKEA,  
Secretary of Hawaii.

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## WAIHAOLE FOREST RESERVE, OAHU.

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### PROCLAMATION OF FOREST RESERVE IN THE DISTRICT OF KOOLAUPOKO, CITY AND COUNTY OF HONOLULU, ISLAND OF OAHU, TERRITORY OF HAWAII.

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Under and by virtue of authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, LUCIUS E. PINKHAM, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby RECOMMEND and APPROVE as a forest reserve to be called the WAIHAOLE FOREST RESERVE, those certain pieces of government and privately owned land in the District of Koolaupoko, City and County of Honolulu, Island of Oahu, Territory of Hawaii, which may be described roughly as embracing most of the higher forested portion of the land

of Waiahole and containing an area of 1,168.55 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department, marked Government Survey Reg. Maps Nos. 312 and 2196 and "Waiahole Forest Reserve," and a description accompanying the same, numbered C. S. F. 2906, which said description now on file in said Survey Department is as follows:

### WAIAHOLE FOREST RESERVE.

Including the Government lands of Makawai, Waianu I, and Kapikokau, and the Ili of Hanakea (L. C. A. 8603 to Kaniau).

Waiahole, Koolaupoko, Oahu.

C. S. F. 2906.

Beginning at Government Survey Trig. Station "Makikiki," the true azimuth and distance to Government Survey Trig. Station "Puu Kauai" being  $290^{\circ} 19' 50''$  7232.3 feet, as shown on Government Survey Registered Map No. 312, and running by true azimuths:

1.  $337^{\circ} 40'$  1038.4 feet along Grant 4111 to L. L. McCandless to a + on stone at the Northeast corner of Hanakea, L. C. A. 8603 to Kaniau;
2.  $347^{\circ} 29'$  565.7 feet along East boundary of Hanakea, L. C. A. 8603 to Kaniau, and West boundary of Grant 4111 to L. L. McCandless to a + on stone on top of ridge;
3.  $335^{\circ} 06'$  378.0 feet along Grant 4111 to L. L. McCandless to a point on North bank of Waiahole Stream; passing over a 4-inch pipe filled with concrete near the North corner of a taro patch at 322.5 feet;
4.  $18^{\circ} 40'$  106.8 feet across Waiahole Stream to Redwood Post at Northwest corner of L. C. A. 8187B, Apana 1, to Kuhia;
5.  $58^{\circ} 26'$  100.3 feet along L. C. A. 8187B, Apana 1, to Kuhia, to a Redwood Post;
6.  $321^{\circ} 36'$  330.0 feet along L. C. A. 8187B, Apana 1, to Kuhia, to a pipe;
7.  $37^{\circ} 36'$  340.4 feet along Lot 5 of the Waiahole Homesteads to pipe;
8.  $252^{\circ} 13'$  1061.4 feet along Lot 5 of the Waiahole Homesteads to a pipe;
9.  $294^{\circ} 05' 30''$  891.0 feet along Lot 5 of the Waiahole Homesteads to Government Survey Trig. Station "Kualele" marked by a + on stone;
10.  $326^{\circ} 57'$  448.6 feet along Lot 5 of the Waiahole Homesteads hill known as Kuolani, the co-ordinates from Government Survey Trig. Station "Puu Kauai," being 472.4 feet South and 4138.4 feet West;
11. Thence along the ridge between Waiahole and Kaalaea, the direct azimuth and distance being:  $12^{\circ} 20'$  2100 feet;
12. Thence still along the ridge between Waiahole and Kaalaea, the direct azimuth and distance being:  $94^{\circ} 50'$  1042 feet;
13. Thence still along the ridge between Waiahole and Kaalaea, the direct azimuth and distance being:  $70^{\circ} 05'$  2927 feet;
14. Thence still along the ridge between Waiahole and Kaalaea, to the junction of said ridge with the central or Koolau range, the direct azimuth and distance being:  $29^{\circ} 47'$  1520 feet;

15. Thence following along the Koolau range, the direct azimuth and distance being: 105° 30' 4360 feet;
16. Thence still along the Koolau range to the point where the boundary between Waianu I and Waianu II touches it, the direct azimuth and distance being: 173° 50' 4585 feet;
17. 241° 12' 2800.0 feet along Waianu II, L. C. A. 5936 to Puuki;
18. 267° 00' 450.0 feet along Waianu II, L. C. A. 5936 to Puuki;
19. 255° 00' 3170.0 feet along middle of Waianu Stream; a flat rock on South edge of stream being marked with +;
20. 21° 40' 1376.0 feet along Kapuakea, Grant 2874 to Kaopulupulu, to top of ridge;
21. 245° 55' 1518.0 feet along Kapuakea, Grant 2874 to Kaopulupulu, along top of ridge;
22. 267° 00' 198.0 feet along Kapuakea, Grant 2874 to Kaopulupulu, along top of ridge to the point of beginning.

AREA 1168 55/100 Acres.

#### AREAS.

	Acres.
L. C. A. 7656, Apanas 1, 2 and 3, to Keakini in Kaululoa, Makawai .....	3.25
L. C. A. 10625, Apanas 1 and 2, to Paikau, Kaululoa, Makawai..	1.11
L. C. A. 8787B, Apana 2, to Kuhia, in Makawai.....	.89
L. C. A. 8052, Apana 3, to Ehu, in Waianu I.....	1.00
L. C. A. 7659, portion of, to Kupihea, in Waianu I.....	1.62
L. C. A. 8603, Mahele 2, to Kaniau, Ili of Hanakea.....	32.05
Government land of Makawai.....	888.75
Government land of Kapikokau.....	53.70
Government Ili of Waianu I.....	186.18
Total.....	1168.55

And as provided by law, subject to existing rights, I do hereby SET APART as parts of the WAIAHOLE FOREST RESERVE, those portions of the government lands of Makawai (888.75 acres), Kapikokau (53.70 acres), and Ili of Waianu I (186.18 acres), altogether an area of 1,128.63 acres, more or less, that lie within the metes and bounds of the above described WAIAHOLE FOREST RESERVE.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.  
(SEAL) DONE at the Capitol, in Honolulu, this 19th day of June, A. D. 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

By the Governor:

CURTIS P. IAUKEA,  
Secretary of Hawaii.

## KEAUOHANA FOREST RESERVE, HAWAII.

PROCLAMATION OF FOREST RESERVE, DISTRICT OF PUNA,  
ISLAND AND COUNTY OF HAWAII, TERRITORY OF HAWAII.

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, LUCIUS E. PINKHAM, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby SET APART as a forest reserve to be called the KEAUOHANA FOREST RESERVE, subject to existing rights, a portion of that certain piece of government land called Keauohana, in the District of Puna, Island and County of Hawaii, Territory of Hawaii, containing a net area of 271.60 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2589 and "Keauohana Forest Reserve," and a description accompanying the same numbered C. S. F. 2755, which said description now on file in said Survey Department, is as follows:

## KEAUOHANA FOREST RESERVE.

Keauohana, Puna, Hawaii.

C. S. F. 2755.

Beginning at the West corner of this tract, at a post and pile of stones marking the North corner of Lot 1 of the Kikala-Keokea Homesteads, the co-ordinates of said point of beginning referred to Government Survey Trig. Station "Hakuma," being 26039.9 feet North and 7828.1 feet East, as shown on Government Survey Registered Map No. 2589, and running by true azimuths:

1. 324° 20' 3834.5 feet along Lot 1 of the Kikala-Keokea Homesteads;
2. 304° 16' 136.8 feet along a 50-foot road reserve;
3. 324° 20' 1030.6 feet along a 50-foot road reserve;
4. 214° 16' 1947.0 feet along Government land to an ahu and an ohia marked F. R.;
5. 150° 33' 5991.2 feet along Government land to an ahu and post;
6. 136° 30' 317.1 feet along Government land to an ahu and post on the East or makai side of the upper Puna road;
7. Thence along said road to the point of beginning, the direct azimuth and distance being: 16° 15' 3152.1 feet.

AREA 277 10/100 Acres.

Excepting and reserving therefrom that portion of the Kalapana Road passing through this tract, LEAVING A NET AREA OF 271 60/100 ACRES.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.  
(SEAL) DONE at the Capitol, in Honolulu, this 19th day of June,  
A. D. 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

By the Governor:

CURTIS P. IAUKEA,  
Secretary of Hawaii.



## ADDITION TO MAKAWAO FOREST RESERVE, MAUI.

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 PROCLAMATION OF MODIFICATION OF BOUNDARY OF THE  
 MAKAWAO FOREST RESERVE, DISTRICT OF HAMAKUAPOKO,  
 ISLAND AND COUNTY OF MAUI, TERRITORY OF HAWAII.
 

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Under and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, LUCIUS E. PINKHAM, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby MODIFY the boundary and increase the area of the Makawao Forest Reserve, in the District of Hamakuapoko, Island and County of Maui, Territory of Hawaii, created and set apart by proclamation of the Governor of Hawaii, on April 21, 1908, and modified and enlarged by proclamation of the Governor of Hawaii, on June 5, 1909, and as provided by law, I do now and hereby SET APART as an integral part of the Makawao Forest Reserve, subject to existing rights, that certain portion of the Haleakala Government Tract, situated between Kahakapao Gulch and Waiohiwi Stream, containing an area of 263 acres, more or less, in the land of Makawao, District of Hamakuapoko, Island and County of Maui, Territory of Hawaii, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2394 and "Addition to Makawao Forest Reserve, Portion of Haleakala Government Tract, Makawao, Hamakuapoko, Maui," and a description accompanying the same numbered C. S. F. 2754, which said description now on file in said Survey Department is as follows:

## Addition to

## MAKAWAO FOREST RESERVE.

Portion of Haleakala Government Tract, Makawao, Hamakuapoko, Maui.

## C. S. F. 2754.

Beginning at a + on a rock on the Pali-a-ka-Moa Falls, at the East corner of this piece and the North corner of the MAKAWAO FOREST RESERVE, said marked rock being on the boundary of this tract and the land of Haiku, the co-ordinates of said point of beginning referred to Government Survey Trig. Station "Pihiolo," being 3773.9 feet South and 7410.0 feet East, as shown on Government Survey Registered Map No. 2394, and running by true azimuths:

1. 34° 39' 4874.0 feet along the Makawao Forest Reserve to a Forest Reserve monument on the West edge of the Kahakapao Gulch;
2. Thence along the top edge of Kahakapao Gulch along Lot 130 of the Haleakala Homesteads, the direct azimuth and distance being: 193° 51' 1298.5 feet to a pipe;
3. Thence still along the top edge of Kahakapao Gulch along Lot 131 of the Haleakala Homesteads, the direct azimuth and distance being 174° 35' 853.6 feet to a pipe;
4. Thence still along the top edge of Kahakapao Gulch along Lot 132 of the Haleakala Homesteads, the direct azimuth and distance being 183° 48' 824.2 feet to a pipe;

5. Thence still along the top edge of Kahakapao Gulch along Lot 133 of the Haleakala Homesteads, the direct azimuth and distance being  $119^{\circ} 08'$  759.5 feet to a pipe;
6. Thence still along the top of Kahakapao Gulch along Lot 134 of the Haleakala Homesteads, the direct azimuth and distance being  $145^{\circ} 53'$  800.2 feet to a pipe;
7.  $54^{\circ} 45'$  192.0 feet across a small gulch along Lot 134 of the Haleakala Homesteads to a pipe on the top edge of the gulch;
8. Thence along the top edge of the gulch along Lot 135 of the Haleakala Homesteads to a point on the South boundary of Grant 2885 to Kauwe; the direct azimuth and distance being  $155^{\circ} 50'$  694.2 feet;
9.  $267^{\circ} 56'$  297.0 feet along Grant 2885 to Kauwe to a mamane post at the bottom of the Kahakapao Gulch;
10.  $178^{\circ} 10'$  584.0 feet along Grant 2885 to Kauwe;
11.  $154^{\circ} 30'$  1142.0 feet along Grant 2885 to Kauwe to the Wai-o-Hiwi Falls;
12. Thence up along the middle of Waiohiwi Stream along the land of Haiku to the point of beginning, the direct azimuth and distance being  $296^{\circ} 20'$  4746.0 feet.

AREA 263 32/100 Acres.

Excepting and reserving therefrom a right-of-way for pipe line across this tract and also that portion of the Piiholo Road within this tract (area 32/100 acre), LEAVING A NET AREA OF 263 ACRES, more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.  
(SEAL) DONE at the Capitol, in Honolulu, this 19th day of June, A. D. 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

By the Governor:

CURTIS P. IAUKEA,  
Secretary of Hawaii.

---

## WITHDRAWALS FROM HONOLULU WATERSHED FOREST RESERVE, OAHU.

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### PROCLAMATION OF WITHDRAWAL OF CERTAIN LANDS FROM THE HONOLULU WATERSHED FOREST RESERVE, DISTRICT OF HONOLULU, CITY AND COUNTY OF HONOLULU, ISLAND OF OAHU, TERRITORY OF HAWAII.

---

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, LUCIUS E. PINKHAM, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby

withdraw and eliminate from the Honolulu Watershed Forest Reserve in the District of Honolulu, City and County of Honolulu, Island of Oahu, Territory of Hawaii, created and set apart by proclamation of the Acting Governor of Hawaii, on October 13, 1913, those three certain pieces of government land on Tantalus Heights, containing 1.520, 0.137 and 0.103 acres, more or less, respectively, in the District of Honolulu, City and County of Honolulu, Island of Oahu, Territory of Hawaii, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2397, "Government Lots 1 and 2, within Honolulu Watershed Reserve, granted to Trs. H. P. Baldwin Est., Tantalus Heights, Honolulu, Oahu," and "Exchange, Territory of Hawaii and W. F. Frear, Tantalus Heights, Honolulu, Oahu," respectively, and descriptions accompany the same in three parts numbered C. S. F. 2927, 2675, and 2849, respectively, which said descriptions, now on file in said Survey Department, are as follows:

Portion of Lot 1, of Grant 6730, to Trustees, H. P. Baldwin Estate, within Honolulu Watershed Forest Reserve, Opu, Tantalus Heights, Honolulu, Oahu.

C. S. F. 2927.

Beginning at a 1½-inch pipe at the North corner of L. C. A. 11029, Part 1, to J. Stevenson, said point of beginning being by true azimuth and distance 310° 17' 1099.0 feet from Government Survey Trig. Station "Kakea," as shown on Government Survey Registered Map No. 2397, and running by true azimuths:

1. 136° 35' 220.8 feet along remaining portion of Lot 1, along boundary of Honolulu Watershed Reserve;
2. 141° 05' 70.9 feet along same to the South side of road;
3. 261° 48' 161.0 feet along the South side of road;
4. 226° 49' 78.3 feet along the South side of road;
5. 309° 16' 176.0 feet along Government land;
6. 360° 00' 70.0 feet along Government land;
7. 26° 33' 209.5 feet along Government land;
8. 131° 13' 75.0 feet along L. C. A. 11029, Part 1, to J. Stevenson, to the point of beginning.

AREA 1.52 Acres.

---

Government Lot 2, Tantalus Heights, Honolulu, Oahu.

Grant 6730, to the Trustees of H. P. Baldwin Estate, within Honolulu Watershed Forest Reserve.

C. S. F. 2675.

Beginning at the Northeast corner of the "Olindita" property, the co-ordinates of said corner referred to "Kakea" Trig. Station being 261.7 feet North and 463.4 feet East, and running by true azimuths:

1. 319° 30' 146.5 feet along the "Olindita" property;
2. 221° 15' 32.7 feet along the H. P. Baldwin Estate;
3. 282° 7' 39.6 feet along H. P. Baldwin Estate;
4. 130° 00' 55.0 feet along new road;
5. 136° 00' 83.2 feet along same;
6. 89° 55' 55.5 feet to the point of beginning.

AREA 137/1000 Acre.

---

Territory of Hawaii to W. F. Frear.

Portion of Government land, Tantalus Heights, Honolulu, Oahu.

C. S. F. 2849.

Beginning at a pipe at the East corner of this piece and the South corner of Grant 4577 to W. F. Frear, the co-ordinates of said point of beginning referred to Government Survey Trig Station "Tantalus," being 4039.2 feet South and 269.6 feet East, as shown on Government Survey Registered Map No. 2397, and running by true azimuths:

1. 17° 45' 92.0 feet along West edge of Manoa Valley;
2. 121° 26' 55.6 feet along Government land;
3. 217° 30' 35.7 feet along the East side of Tantalus road;
4. 202° 30' 27.3 feet along the East side of Tantalus road;
5. 168° 10' 24.4 feet along the East side of Tantalus road;
6. 130° 00' 61.6 feet along the Northeast side of Tantalus road;
7. 301° 26' 112.0 feet along Grant 4577 to W. F. Frear to the point of beginning.

AREA 4485 Square Feet.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.  
(SEAL) DONE at the Capitol, in Honolulu, this 19th day of June, A. D. 1918.

LUCIUS E. PINKHAM,  
Governor of Hawaii.

By the Governor:

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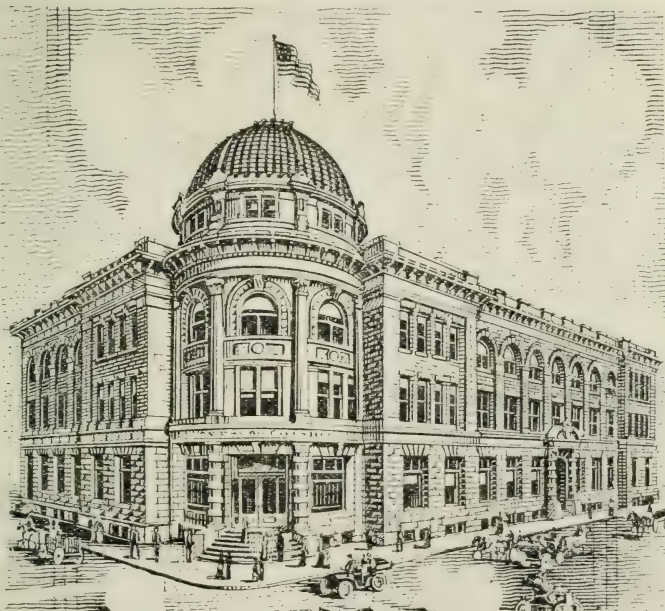
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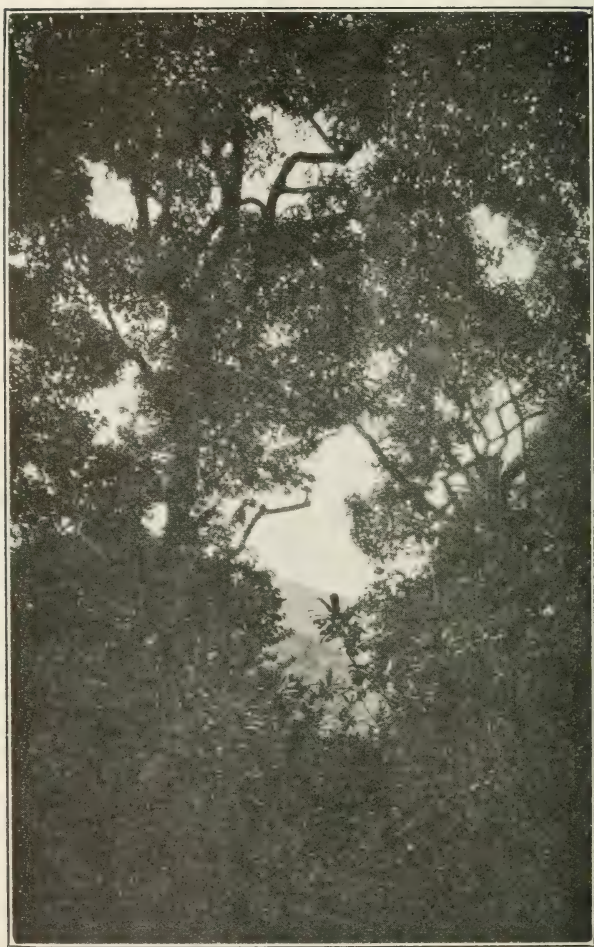
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

AUGUST, 1918

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C. H. ATHERTON.....	Director
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McBryde Sugar Company, Ltd.	New Zealand Insurance Company
Kahuku Plantation Company	German Alliance Insurance Association
Kauai Fruit and Land Company, Ltd.	Switzerland Marine Insurance Company, Ltd.
Kahului Railroad Company	

# The Hawaiian Forester and Agriculturist

A Monthly Magazine of Forestry,  
Entomology, Animal Industry  
and Agriculture.

Issued under the direction of the Board  
of Commissioners of Agriculture  
and Forestry, Territory of Hawaii.



Address all communications to

**DANIEL LOGAN**

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desire to ascertain along what lines their productions may be improved.

The opportunity of obtaining a permit to occupy a definite camp site in the high mountain region of Kauai, where one may be refreshed by the cool climate, entertained by the song of wild birds, allured by the nimble wild goat and inspired by the grandeur of a great variety of scenery, is now offered by the Division of Forestry.

## Division of Forestry

Honolulu, Hawaii, July 24, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of June, 1918.

### NEW FOREST RESERVE.

At the public hearing of the Governor and this Board held at the Government Nursery, Honolulu, on June 19, no objections were raised against the creation of the following new forest reserves and the Governor, therefore, on the same day signed the proclamations setting them apart:

Papapaholahola Spring Reserve, Kauai.....	Area,	54 acres
Waiahole Forest Reserve, Oahu.....	"	1,169 "
Keauohana Forest Reserve, Hawaii.....	"	272 "
Addition to Makawao Forest Reserve, Maui...	"	263 "
Total area of new reserves.....		1,758 "

At the same time 1.76 acres on Tantalus Heights were eliminated from the Honolulu Watershed Forest Reserve, Oahu, for the purpose of perfecting certain necessary exchanges for land needed for the new Round Top road.

These new projects, including the 28,260 acres of Kahoolawe which were eliminated from the forest reserve on April 20, 1918, leave at the present date a total net area of 773,951 acres in the 42 forest reserves throughout the Territory. Of this area, 521,557 acres or 69 per cent. is government land.

### FOREST RESERVE FENCING.

Preparations were made during the month for the immediate fencing of the boundaries, where needed, of the new addition

to the Makawao Forest Reserve on Maui under the supervision of Ranger Lindsay. Natural barriers keep stock from a part of the forest, but about 4,500 feet of fence is needed to give the forest complete protection.

The resolution passed by the Board on June 6, requesting the Commissioner of Public Lands to enforce the requirements in General Lease No. 730 concerning the fencing of the boundaries of the Makua-Keaau Forest Reserve, Oahu, was duly delivered but, so far as can be ascertained, no action has been taken up to this date.

#### ELIMINATING STOCK FROM FOREST RESERVES.

During the month several permits were issued for hunting unbranded wild cattle and wild goats on unleased government lands on the forest reserves of Kauai and Oahu, provided as full use as possible is made of the animals that are killed. By issuing such permits to responsible parties it is believed that much progress can be made in ridding the forests of a large amount of wild stock.

On the advice of the President, on June 12, I addressed similar letters to Dr. J. H. Raymond and Mr. H. W. Rice, advising them to remove from the Kula Forest Reserve, Maui, whatever cattle they claimed ownership to, by August 1, 1918, and that after that date, Rule II in regard to cattle grazing on the forest reserve would be strictly enforced. Amenable replies have been received from both of these gentlemen who have expressed the intention of complying with the above rule.

#### FOREST PLANTING.

The planting gangs in Manoa and Makiki devoted the month to cleaning the weeds and grass from around planted trees and in replanting blanks. On Kauai, Ranger Lovell planted out 226 silk oak trees on the Kealia Reserve.

#### TERRITORIAL FAIR.

The forestry exhibit at the First Territorial Fair held on June 10 to 15, at Kapiolani Park, Honolulu, as a part of the Board's exhibit, attracted a great many interested visitors. Of special interest was the collection of large bamboos kindly furnished by Dr. B. D. Bond of Kohala, Hawaii, and the working erosion model which actually demonstrated in a very telling and simple manner the beneficial effects of a forest cover in retarding the runoff and in preventing excessive erosion.

#### CAMPING SITES.

From June 20 to 29, I was on Kauai, with a government surveyor marking on the ground the camping sites for which ap-

plications have been made in the Kokee region of the Na Pali-Kona Forest Reserve. A full report of this subject will be submitted as soon as the map of the region is received. At the same time the boundaries of the proposed new Puukapole Forest Reserve were marked on the ground and surveyed.

#### RULE IV.

On June 2, nine Chinese and Hawaiians made an unauthorized visit to Manana off Makapuu Point, Oahu, and killed rabbits without a permit in violation of Rule IV of this Division. These were arrested by the police the following day and on June 4 all nine appeared in court, pleaded guilty and were given a suspended sentence of 13 months.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

#### REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, July 17, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR:—I herewith submit a report of the principal work done during the month of June:

#### NURSERY.

##### *Distribution of Plants.*

	Seed Boxes	Transplant Boxes	Pot Grown	Total
Sold . . . . .	.....	50	126	176
Gratis . . . . .	2400	1650	691	4741
Total . . . . .	2400	1700	817	4917

#### COLLECTIONS.

##### *Government Realizations.*

Collections on account plants sold.....\$3.45

##### *Preservation Forest Reserves.*

Collections for quarter ended June 30, 1918:

Sale of black sand:

7 loads @ \$25 cents.....\$ 1.75  
92 loads @ 50 cents . . . . . 46.00  
Rent premises Half-way House, Tantalus..... 30.00  
Fee for use of land and gathering ti leaf, Pauoa Valley... 12.50

Total . . . . . \$90.25

## PLANTATION COMPANIES AND OTHER CORPORATIONS.

We have on file orders for 60,000 plants in seed boxes and 5,000 in transplant boxes to be delivered at the end of August.

## MAIKI STATION.

The work at this station has been principally routine consisting of mixing and sterilizing soil, transplanting and potting plants, etc.

## HONOLULU WATERSHED PLANTING.

The work under this heading has been confined to clearing and repairing trails and making holes for trees.

## ADVICE AND ASSISTANCE.

The writer has been asked to call and otherwise give advice as follows:

Calls made . . . . .	6
Advice by telephone . . . . .	7
Advice by letter . . . . .	2
Advice given at Nursery . . . . .	10

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

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## Division of Entomology

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Honolulu, Hawaii, July 19, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month of June the insectary handled 26,500 pupae of the melon fly, from which there were bred 1,332 females and 1,014 males, *Opis fletcheri*.

The distribution of parasites was as follows:

*Opis fletcheri*.

	Females.	Males.
Oahu:		
Heeia . . . . .	360	300
Kaimuki . . . . .	600	460
Maui:		
Hana . . . . .	100	50
Hawaii:		
Waimea . . . . .	306	215



*Opius humilis.*

Oahu:		
Kaimuki . . . . .	100	80
Nuuanu . . . . .	80	25

*Diachasma tryoni.*

Oahu:		
Kaimuki . . . . .	400	150
Nuuanu . . . . .	135	50

*Tetrastichus giffardianus.*

Oahu:		
Kaimuki . . . . .	200	....
Hawaii:		
Waimea . . . . .	1000	....

*Spalangia cameroni.*

Maui:		
Paia . . . . .	4200	....

*Paranagrus osborni.*

Oahu:		
Manoa . . . . .	1100	....
Makiki Nursery . . . . .	2500	....
Heeia . . . . .	1700	....
Aiea . . . . .	2200	....
Hawaii:		
Waimea . . . . .	4400	....
Maui:		
Paia . . . . .	5600	....
Kauai:		
Kahaheo . . . . .	1600	....
Molokai:		
Pukoo . . . . .	1700	....

Respectfully yours,

DAVID T. FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, June 30, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of June, 1918, as follows:

During the month there arrived at the Port of Honolulu 38 vessels of which 18 carried vegetable matter with the following results:

<i>Disposal.</i>	<i>Lots.</i>	<i>Parcels.</i>
Passed as free from pests.....	574	10,063
Fumigated . . . . .	7	97
Burned . . . . .	23	23
Returned . . . . .	1	2
Total Inspected . . . . .	605	10,185

Of these shipments 9,936 packages arrived as freight, 85 packages as mail and 164 packages as baggage.

### RICE AND BEAN SHIPMENTS.

During the month 12,125 bags of rice and 1,238 bags of beans arrived from Japan and Oriental ports, all of which were free from pests.

### PESTS INTERCEPTED. \*

Approximately 2,807 pieces of foreign baggage belonging to passengers and immigrants from foreign countries were examined and from these were seized and destroyed by burning 23 lots of fruit.

The following disposal was made of plants and seeds from various sources:

On June 4, a case of plants from the mainland was fumigated for scale insects and released.

On June 7, two plants from Manila brought by a member of the ship's crew were returned to the ship.

On June 18, a package of corn in the mail from Mexico was fumigated for an infestation of weevils and the Angumois Grain Moth.

On June 25, a case of Orchids from Manila were fumigated as a precaution.

On June 27, four packages of tree seed from Sydney in the mail were fumigated as a precautionary measure and passed.

## HILO INSPECTION.

Brother M. Newell reports the arrival of four steamers, one of which carried vegetable matter consisting of 107 lots and 2,470 parcels. All of these were passed as free from pests.

## KAHULUI INSPECTION.

Mr. Will J. Cooper, Plant and Fruit Inspector for Maui, reports the arrival of 2 vessels at the port of Kahului, both of which brought vegetable matter consisting of 52 lots and 607 packages, all of which were found to be free from pests.

## INTER-ISLAND INSPECTION.

Fifty-eight steamers plying between Honolulu and other island ports were attended, and the following shipments were passed as free from pests:

Taro.....	756 bags
Vegetables.....	195 packages
Plants.....	162 “
Fruit.....	19 “
Total Inspected.....	1,132 “

Three packages of plants and three packages of fruit were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry.

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Honolulu, Hawaii, July 19, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of June, 1918.

## TERRITORIAL FAIR.

The principal part of the past month was taken up with preparation for and attendance at the Territorial Fair. One exhibit

of pathological specimens, and especially those from condemned tuberculous cows, attracted much attention.

As far as the live stock was concerned, the writer acted as judge in the dressed carcass contest of the blue ribbon winners in the fat steer and fat hog classes, while Doctor Case acted as superintendent of the entire beef cattle exhibit.

#### BLACKLEG ON MAUI.

The absence of Doctor Fitzgerald, Deputy Territorial Veterinarian for Maui, from the Fair, was due to an outbreak of blackleg, first suspected and reported to be anthrax among a bunch of calves and yearlings in Kula, Maui. The true nature of the disease was soon established and a cable to Washington resulted in the receipt of 1,000 doses of blackleg vaccine in the record time of twelve days. Five hundred doses were sent to Doctor Fitzgerald, who reports that no more deaths have occurred since the six cases first reported. How this disease has gained entrance into the Territory remains a mystery. It will be recalled that a single case occurred in Kalihi Valley, Honolulu, about two years ago. That was the first and only case recorded in the Territory up to the Maui outbreak.

Blackleg is a fatal infectious disease, affecting only young cattle—from six months to two years old. It is easily controlled by vaccination, but unless all carcasses are burned the infection will remain effective for years.

#### GLANDERS (?) ON OAHU AND MAUI.

The chief of the local army veterinarians informed this office that he was in receipt of a report that glanders had been diagnosed among the horses of one of the remaining cavalry troops. As glanders has not occurred here for several years and as it did not seem possible that the disease could have been brought in with the few officers' chargers which have arrived here during recent years, a visit was made to the barracks without delay. One horse had been isolated, at a considerable distance from the stables, where, at the time of our arrival, it was being "fenced in."

The animal was a powerful cavalry mount, in good condition, which exhibited on the left hind leg, mostly below the hock, and principally on the inside, a number of nodules, none of them more than a third of an inch in diameter. While some of these seemed to be arranged in a line, they were not connected by swollen lymph vessels. A few looked as if they had broken open, discharged their contents and healed again, but no farcy ulcers were observed. While the leg was slightly enlarged below the hock there was no approach to that diffuse swelling which characterizes either true farcy or epizootic lymphangitis. Contrari-



wise, however, the animal had given typical reaction to the official (ophthalmic) mallein test, and so had about a dozen other mounts from the troop, even though none of them showed any clinical symptoms of glanders or farcy.

In order to test the effectiveness of the mallein which had been used consent was obtained to submit the affected, as well as the reacting animals, to an intradermal injection with Bureau of Animal Industry mallein, which had been brought along. This was done, but when visited the next day, none of the injected animals had reacted. It was further learned that the affected animal had been subject to similar attacks for at least three years. The diagnosis of true (glanders) farcy was therefore excluded, while that of epizootic lymphangitis was highly improbable. There remained that of ulcerative lymphangitis (Preis Nocard) or perhaps an atypical form of the common streptococcic cellulitis.

While there was ample grounds upon which the animal could have been destroyed, having for instance given typical reaction to the official mallein test, it was suggested that the horse be sent to our quarantine station for observation and experimental treatment. During the two weeks required for this transfer another horse developed similar symptoms and was destroyed. On post mortem examination, I am informed, no symptoms of glanders were found.

The fact that these various forms of lymphangitis have come to play a very important role among the horse stock on the various war fronts, and as we have but recently had a severe outbreak of similar nature among the plantation animals in the Hamakua district, there is every reason to avail ourselves of any opportunity to study the nature, cause, prevention and treatment of these obstinate and very frequently fatal diseases. While it is probable that the animal now at the quarantine station could be treated with local applications effecting an apparent cure, it is equally certain that only constitutional treatment could result in a permanent cure, and to this end experiments are now under way.

During the month Doctor Fitzgerald cabled for a supply of mallein and reported that he had diagnosed glanders in a horse in the Makawao district. As the horse was old and of little value, it was destroyed and post mortem examination seemed to bear out the clinical diagnosis. Upon receipt of the mallein sent him he tested all horse stock which had been in contact with the case for the past six months but failed to find a single reactor. He came to the conclusion that some other disease than glanders, possibly epizootic lymphangitis, had been the cause. There has been no glanders in that district for seven years, but the doctor points out that the case was only one mile removed from the six cases of blackleg above referred to.

## BOVINE TUBERCULOSIS CONTROL.

Referring to the appended report of the Assistant Territorial Veterinarian, especial attention is called to the very low percentage of reactors to tuberculin now found outside of the city limits of Honolulu. The railroad ranches are quoted with two reactors out of 638 tested during this month; one of these was found, when butchered, not to be affected with tuberculosis, leaving but one reactor out of 638 animals. When added to the 631 head with 3 reactors already reported on we get for the railroad ranches a total of 1269 head with 4 reactors or 0.31%. Attention is also called to the standing of the two dairies which furnish practically all the milk to Castner and Schofield Barracks—J. A. Templeton with 87 cows and C. Toat with 28. In neither stable was a single reactor found.

## SWINE PLAGUE.

This disease has occurred in at least two piggeries in the Kalihi district as well as at Waipahu and on the Island of Maui. The proper name for swine plague is hemorrhagic septicemia of hogs, and as such it comes under the special anthrax appropriation act of 1917. This disease in most cases is easily checked by means of vaccination, the cost of the vaccine being from one to two dollars per dozen treatments, according to the size of the animals and the severity of the outbreak. The anthrax appropriation being exhausted it is unfortunate that a revolving fund for the purchase of hemorrhagic septicemia vaccine was not established in time, as it has been reported that a number of Orientals are losing pigs now and then, in the same district, but are reluctant to report or admit it for fear of quarantine and cost. If the Board could see its way to expend about \$350.00 we could keep on hand about 2,000 doses (167 dozen at \$2.00—\$324.00) and the vaccination could be enforced whenever necessary while payment or restitution of the amount used could be exacted from those realizing the benefit derived from the treatment. We furnished to Maui's deputy \$68.00 worth of vaccine last month and under a recent date he reports "it is the best stuff we have used here and it has saved the county many thousand pounds of pork." The manufacturers are opposed to allowing druggists to handle the vaccine.

## COST OF ANTHRAX SERUM VACCINE.

It has just been learned that the anthrax serum vaccine for which this Board last year paid 34 cents per dose (list price 40 cents) has been reduced to 25 cents (list price).

## VIOLATION OF LIVE STOCK IMPORTATION RULES.

A steamer from San Francisco arrived in Honolulu with ten

mules on board, consigned to a plantation on Kauai. This office was not notified of either the arrival of the steamer nor of the fact that it had live stock on board. The latter is a direct violation of the rules in question. The steamer remained here nearly three days—with the mules on board—then proceeded with them to Port Allen, Kauai, another direct violation of the rules which forbid the landing of horse stock from California at any place except Honolulu, Hilo and Kahului.

Upon arrival at Port Allen the captain of the vessel in question, who has carried live stock to these islands for years, seemed to realize his mistake and wired the Honolulu agents of the plantation to which the mules were consigned, asking how he was to dispose of them. The agents notified this office and a wireless was sent to Kauai directing Doctor Golding at Hanalei to proceed to Port Allen and, in case the mules were accompanied by the requisite certificates of health, to arrange for their quarantine at the point of landing; otherwise he was to refuse a permit to land, the mules to be brought back to Honolulu for mallein testing and quarantine. The latter contingency was fortunately avoided, the captain having the mallein test certificates with him, and the mules appeared to be healthy. They were quarantined in a lumber yard near the landing, but Doctor Golding, who just then had his hands full at Hanalei, had to travel from there to Port Allen three times, an aggregate of more than 300 miles, at the expense of this Board.

The revised rules and regulations pertaining to the importation of live stock are now being printed and will, when distributed, be accompanied by a circular letter memorializing the agents of stock carrying vessels of the necessity of adhering more strictly to the requirements of this Board.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

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## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, July 19, 1918.

Dr. Victor A. Nörgaard, Chief, Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu, T. H.

SIR:—I have the honor to submit the following report for the month of June, 1918:

## TUBERCULOSIS CONTROL.

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
O. R. & L. Co.....	638	636	2
Salvation Army Home.....	11	11	0
F. H. Kilbey . . . . .	22	20	2
A. Rodriques . . . . .	5	5	0
F. Khristiens . . . . .	3	3	0
H. Kobelansky . . . . .	4	4	0
Ah Fong Akiona . . . . .	1	1	0
V. Souza . . . . .	7	7	0
M. H. Saunders . . . . .	1	1	0
J. A. Templeton . . . . .	87	87	0
C. Toat . . . . .	28	28	0
Frank de Mello . . . . .	18	18	0
K. Okomoto . . . . .	9	9	0
Matsuitaro Saito . . . . .	8	8	0
K. Hirau . . . . .	2	2	0
Waianae Plantation . . . . .	95	92	3

From the above tabulated list it will be seen that a total of 939 head of cattle were tested, out of which number 932 were passed and 7 condemned and branded. Of the condemned animals, 6 have been slaughtered and disposed of according to Act 121 of the 1917 Session Laws.

## SORE HEAD IN CHICKENS.

About 1,000 cc. of chicken pox vaccine and 300 cc. of turkey pox vaccine have been put up in the laboratory and distributed to various poultry raisers for use among their flocks where this disease has broken out. The results were uniformly successful in those cases where the vaccine was used in the beginning of the outbreak.

## SWINE PLAGUE.

Two small outbreaks of Septicemia Hemorrhagica or Swine Plague were reported during the past month. The losses, all told, amounted to only four animals. In one case Swine Plague vaccine was administered with notably beneficial results. When obtainable, this vaccine has proven a great value in controlling outbreaks of this disease. A large amount of Swine Plague vaccine has been ordered from the mainland and will soon be available in checking further outbreaks.

## LIVE STOCK IMPORTATIONS.

S. S. Lurline, San Francisco: 4 horses, Angus McPhee; 10



mules, Wailuku Sugar Company; 1 Holstein bull, C. W. La  
 1 ct. chickens, G. W. Weller; 1 pkg. live birds, W. F. X. Co.  
 S. S. Manoa, San Francisco: 1 Berkshire hog, John Water-  
 house.

Respectfully submitted,

LEONARD N. CASE,  
 Assistant Territorial Veterinarian.

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## Marketing Division

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Honolulu, Hawaii, July 15, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu,  
 T. H.

GENTLEMEN:—During the month consignments of corn, beans, grapes, bananas, beef and other island products were received by the Division, most of which were readily sold at good prices. Several large shipments of grapes were received from Hawaii, but due to their having been shipped between decks, instead of on deck as instructed by the shipper, they arrived at the Division in very poor condition and only a small portion of the shipments were fit to be sold.

The sales for the month amounted to \$13,158.08, which are \$1,030.00 less than the sales for the month of May.

The books have been gone over carefully and all bad accounts, with the exception of the pineapple accounts, have been written off. An inventory of the pineapple crates on hand was taken and the difference as shown by the books has been written off to profit and loss.

Enclosed herewith is a statement of the operations for the month and a copy of the general trial balance.

Respectfully,

O. B. LIGHTFOOT,  
 Acting Superintendent.

# Report of the Board of Commissioners of Agriculture and Forestry for the Fiscal Year Ended June 30, 1918.

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Under the changes of reorganization made by the 1917 legislature, the Board carried on its important activities in the interests of auxiliary agriculture, during the fiscal year, under the following five divisions—forestry, plant inspection, entomology, animal industry, and marketing.

## FORESTRY.

In the interest of conserving an adequate and steady supply of water for use in these islands where the main industries largely depend upon water for irrigation, the Division of Forestry has continued actively to protect the forests and extend them.

During the year new fences on established forest reserve boundaries to keep stock from injuring the native forest have been constructed at Piha, Laupahoehoe, and Olaa, on Hawaii, and at Round Top, Hauula, and Nanakuli, on Oahu, and on Oahu existing fences have been repaired, rendering a total length of 9.11 miles of forest boundary impassable to injurious stock.

In the administration of the forest reserves on the several islands the six forest rangers have rendered efficient service in preventing fire and trespass by stock and man, in fence building and repairing, in tree planting, and in their usual routine work. The elimination of wild cattle from the reserves has been pressed and in one forest region alone on Hawaii 30 head of wild cattle have been eradicated by shooting and roping.

The Territory has been very fortunate during the year in the matter of forest fires, in spite of a very dry summer. Only three fires were reported. One small grass fire at Maili on Oahu and a small brush fire at Waikapu on Maui, did almost no damage and were immediately extinguished. A fire at Piilhonua on Hawaii which broke out in August damaged the native forest on 50 acres but was soon put under control.

The work of extending the forest reserve system has progressed during the year by creating three new reserves and adding to the area of an existing reserve. The whole Island of Kahoolawe, consisting of 28,260 acres, of non-water-producing land, was also withdrawn from the forest reserve so as to return it to the jurisdiction of the Land Commissioner who by law is in the only position to issue a license whereby the destructive goats on the island can be removed and the feed thereon utilized

for fattening cattle for the market. The new reserves consisted of the Papapaholahola Spring on Kauai of 54 acres, the Waiahole on Oahu of 1,169 acres, and the Keauohana on Hawaii of 272 acres, and 263 acres were added to the Makawao Reserve on Maui. This brings the total number of forest reserves in the Territory up to 42, with a total area of 773,591 acres, of which 521,557 acres or 69 per cent. is government land. With the formal setting apart of four new reserves, data on which are now almost ready, the general forest reserve system for the Territory will be completed.

Tree planting has progressed during the year at the usual satisfactory rate and especial attention has been given to reforestation on water-producing areas. As an example, this Division has succeeded in completing the reforestation of all open government land in the Honolulu Watershed Forest Reserve in Manoa Valley, Oahu, and in May finished the planting out of 12,175 koa trees on 63 acres. The reforestation of the open area on the same watershed in the Makiki Valleys has likewise been completed, the native koa tree being used with great success. A great number of new trees from all parts of the world, some suitable for watershed cover and some suitable for the production of timber, have been planted out in favorable localities to determine how well they will grow here.

During the past calendar year the four government nurseries under the control of this Division raised and distributed for general planting throughout the Territory a total of 353,527 tree seedlings. On Arbor Day 12,111 trees were distributed for planting. Reports received from all tree planters throughout the Territory show that during the same period 851,053 trees were planted out on the several main islands. This is well above the average number planted annually during the past decade. One half of these were set out for the purpose of water conservation and sugar plantation companies planted 85 per cent. of them.

Under special authority granted to the Division by the last legislature a campaign for the protection of bird, animal and vegetable life on the small islands off the windward coast of Oahu was begun. Trespass signs have been placed on the islands and to date 22 trespassers have been arrested and convicted.

#### PLANT INSPECTION.

The work performed by the Chief Plant Inspector and his assistants during the past fiscal year consisted of the following:

1. The inspection of all fruits, vegetables and plants coming into the Territory from foreign countries and the mainland of the United States, to prevent the introduction of pests and plant diseases liable to become injurious to the various agricultural industries of these islands.
2. The inspection of all fruits, vegetables and plants going

from the port of Honolulu to the ports of all other islands for the purpose of preventing the spread of any pest now existing on Oahu, as well as any future introduction of pests or fungi from Honolulu, the only port of entry for plants and plant products from foreign countries.

The Division of Plant Inspection was transferred to the new quarters on Kekuanaoa street about January 1, 1918. All plant importations are now brought to the new building immediately upon arrival in the Territory, thus doing away with the old method of opening these shipments on the various docks. The equipment is now such that the danger of introducing new pests has been reduced to a minimum.

During the fiscal period 713 vessels arrived at the ports of Honolulu, Hilo and Kahului, the only ports in the Territory where shipments of fruit and vegetables can enter directly, and at which places local inspectors are stationed. Of these vessels, 294 carried vegetable matter consisting of 299,077 packages of fruit and vegetables and 3,880 packages of plants and seeds. Of this amount 1,099 packages were fumigated because of infestations of various kinds, 654 packages were destroyed by burning either on account of serious infestation or of being contraband, and 34 packages were returned to the original shipper as contraband or unavailable.

Following is a list of the number of packages of the more important fruits and vegetables which arrived in the Territory during the fiscal year:

Oranges . . . . .	31,277
Lemons . . . . .	5,432
Cabbage . . . . .	1,295
Celery . . . . .	1,623
Onions . . . . .	27,377
Potatoes . . . . .	118,503
Apples . . . . .	70,203

The inspection of horticultural produce leaving Honolulu for ports on the other islands has been continued on similar lines to those of last year. During the fiscal period 685 steamers were attended and 12,477 packages of plants, fruit and vegetables inspected. Of this number 89 packages were seized and refused shipment on account of infestation or of having undesirable soil attached to the roots which was liable to carry pests or diseases.

#### ENTOMOLOGY.

No new work in the way of exploring for and introducing beneficial insects has been undertaken since the organization of the division on July 1, 1917, as it is believed by those in authority that the disturbed conditions caused by the war are unfavorable



to the prosecution of such work. The beneficial insects previously introduced—including the fruit fly, melon fly, dung fly and corn leaf-hopper parasites—have been propagated and distributed without interruption, although there is no question about their establishment in the islands. The reason for the continued distribution of the parasites is the necessity of re-establishing or renewing the parasites in particular localities where through depletion or disappearance of the host the parasites become diminished or disappear, and with the reappearance of the host are not present in sufficient numbers to be an effective check to its destructiveness. This is especially true in the case of those species with weak flight, like *Tetrastichus* and *Paranagrus*. The latter parasite requires frequent renewal on the lowlands on account of the discontinuity in the corn crop. The distribution of the different parasites during the year was: fruit fly, 13,505; melon fly, 16,288; dung fly, 5,570; corn leaf-hopper, 264,800, or a total of 300,163.

It is gratifying to have confirmation of the increasing effectiveness of the fruit fly parasites in the investigations of the United States Bureau of Entomology office in Hawaii, and the exceptionally large corn crop of this year testifies to the effectiveness of the leaf-hopper control when managed by progressive farmers. Within a few days it has been learned that an introduction of 1917, a wasp brought from the Philippines to prey upon cockroaches, has become established in the islands.

The inability to undertake new work has afforded leisure for study, and many of the problems connected with the control of insect pests have been gone over afresh. It has also allowed the entomologists to undertake a considerable amount of systematic work on the Board's collection of insects, which has been greatly improved and on which four papers have been published and two others are in the course of preparation.

#### ANIMAL INDUSTRY.

During the fiscal year there has been the same steady progress in the development of the different classes of live stock and the suppression of contagious diseases within the Territory which has been noted in past years. The rules and regulations covering the importation of live stock have proven effective in preventing the introduction of the many animal scourges which are causing enormous animal losses in other parts of the world. This effectiveness has been greatly enhanced by recent revision and addition thereto.

Live stock importations have practically been confined to pure-bred registered animals of the different classes for the continued improvement of the herds here. That considerable has been accomplished in this direction is evidenced by the fact that the Territory is now self-supporting as far as beef and pork is concerned

and will soon become so as regards mutton. This improvement was further demonstrated by the unusually large and high class exhibits of imported and island bred animals of all classes at the recent Territorial Fair.

The work in connection with the control and eradication of animal diseases may be summed up as follows:

Glanders has been entirely eradicated; Epizootic Lymphangitis, of which a small outbreak occurred on the Island of Hawaii, is under complete control; Tuberculosis has been reduced from 31.25 per cent to 2 per cent and with the great help of the Compensation Law which became effective last April, the complete eradication of this disease is now in sight; Anthrax, which made its appearance last year on Kauai and was rapidly followed by one outbreak on Oahu and seven distinct outbreaks on Maui, all of which were doubtless due to malicious plants, is now under complete control. Total eradication has been accomplished on the Islands of Oahu and Maui. Due to the effective methods of control immediately instituted, the disease was entirely confined to the original points of outbreak.

#### MARKETING DIVISION.

The past year has been the most successful in the history of the Division. Twenty-two hundred and thirty-nine consignments of different kinds of island products were received and sold for \$172,391.76, an increase of \$50,878.85 over last year's sales, which were \$54,534.96 greater than the sales for 1915-1916. This would indicate that the Division is becoming of more service to the producers of the Territory.

With the aid of the Revolving Fund all consignors were paid within 30 days after their produce had been sold. The number of complaints have been very few. During the months of February and March beans were very plentiful which made it necessary for the Division to store most of the beans received during these two months. As it would take some time to dispose of these beans advances were made from the Revolving Fund of \$3.00 per bag to the bean consignors.

The bean crop last year was the largest the islands have produced. Most of these beans were marketed through the Division at very satisfactory prices. As the Honolulu market was flooded with beans, most of the red beans were shipped to the coast. The small white beans were in rather poor condition and it was recommended that more red beans be planted in their stead.

On the first of the year bananas were very plentiful in Honolulu due to the shortage of shipping space and the planters were losing hundreds of large bunches in the fields. In order to assist the producers, the Division coöperated with the Banana Consuming Propaganda Committee of the Hawaiian Vigilance Corps in creating a local demand for all bananas which could not be

shipped to the coast. The campaign proved successful, but in a short time more shipping space was available and the larger number of bunches shipped to the coast left very few bananas for the newly created demand in Honolulu.

The retail meat and vegetable departments were discontinued on November 30, 1917, with the permission of the Board of Agriculture and Forestry under whose jurisdiction the Division has been operated during the past fiscal year. These departments were losing money due to the uncertainty of supplies and on account of lack of equipment and poor location were not able to carry on the business in a satisfactory manner.

As the demand for seed purchased from the Special Seed Appropriation of the Division was not as great as expected, a large quantity was left on hand most of which has lost its vitality. A quantity of this seed when fresh was turned over to the army with the understanding that it should be paid for out of the products of the post farm.

Some of the pineapple crates purchased from the 1915 Recounting Fund are still on hand, but it is expected that this account will soon be closed.

The purchase of a new truck greatly facilitated the delivery of produce and the hauling to and from the wharves.

The Marketing Demonstrators employed by the Division in cooperation with the Territorial Food Commission have done good work with the farmers on the different islands, but a great part of their work has been devoted to planting and other work for the Food Commission and not enough attention has been given to marketing demonstrations.

Due to the complicated bookkeeping system installed last July, the Division has had considerable trouble in obtaining a bookkeeper who could keep the accounts straight and the auditing bills have been out of all proportion to the amount of business done. If an arrangement could be made by which the Territorial Auditor could audit the Division's books a great saving would be made.

At the special session of the Legislature early in 1918, provision was made to transfer the Division to a new Territorial Marketing Commission to be appointed by the Governor, the above transfer to take place on July 1, 1918.

Mr. A. T. Longley, who has been in charge of the Division for the last five years and under whose management the sales of the Division have increased from a few thousand dollars a year to over one hundred and seventy thousand dollars, has been granted a leave of absence for the duration of the war to serve in the army. He has been succeeded by Mr. O. B. Lightfoot.



## Dressed Carcass Contests Held at the First Territorial Fair and Their Value in the Development of the Live Stock Industry.

BY DR. LEONARD N. CASE,

*Assistant Territorial Veterinarian.*

It may be stated without fear of contradiction that there is no better way of demonstrating the actual improvement in any class of meat-producing animals than a comparison of their records on the block. These records show at once what the producer has done in the way of improving his herd and what remains to be done to reach the final goal, i. e., the early maturing animal having the largest percentage of most valuable cuts.

In this age of conservation and "hooverism" it should be and is the aim of every breeder of meat-producing animals to double his output without increasing his range, to grow more and better feed on the same amount of land and to produce an animal which will mature in half the time it formerly took.

The vast improvement which has taken place in the live stock industry of this Territory in the past ten or twelve years was amply demonstrated at the last Territorial Fair. Such an exhibition would not have been possible a number of years ago. But how does this visible improvement compare with the actual increased value of these animals as food producers; is this increased value of these animals at all commensurate with the time and expense of improvement; is the producer justified in turning grain into meat at the present market prices and system of marketing? These are questions which can be answered only at the killing floors and when the carcass is on the block.

### STEER CONTEST.

For many years on the mainland, both purebred and grade steers have been entered in live stock fairs as exhibitions of breeding and feeding and eventually these steers have been slaughtered and valuable data obtained from the cut carcass. This has been done primarily for the education of the stock raisers and to emphasize those points upon which he should fix his attention and those methods of breeding and feeding most likely to bring about the highest results. A standard of excellence as to form in the live animal and balance in the dressed



carcass has thus been created and also the methods most efficient in bringing about a realization of these standards.

To obtain the best results the breeder should have before him certain standards and work continually toward their attainment. They may be of two kinds: first, a standard of uniformity to type in the particular breed with which he is working, and second, a standard of excellence in the dressed carcass. In the first case, he has the standards evolved by the various breed associations; in the second case, he has to form a standard based upon the slaughter house records.

In the past the breeders here have known little or nothing of the records of their cattle at the abattoir beyond the fact that the fatter they were the heavier they weighed and consequently the more money they received. The condition and appearance of the carcass, the distribution of fat and lean and the percentage of valuable cuts has never entered into their system of breeding. No improvements in this direction could be made because no data on these points was available. Nothing was known about it and consequently no standard of excellence could be formed.

That this aspect of breeding has been overlooked and has been considered of little importance by the breeder can be attributed almost entirely to the system of marketing here. Be the steer young or old, lean or fat, well balanced or otherwise, with a high percentage of offal or low percentage, high percentage of valuable cuts or low percentage, prime quality or low quality, the price is practically the same. Dairy cows have been sold at a price equal to and higher than prime steers. Such a condition is ridiculous. The breeder has had no incentive to raise a higher quality of meat. He receives no adequate reward for his labors in producing an early maturing carcass of prime quality carrying the highest percentage of valuable cuts. And yet these are points of the greatest importance in the production of beef, mutton and pork.

These conditions will gradually be corrected as more interest is taken in the animal, from the time it is slaughtered to the time it is placed before the consumer and nothing is more calculated to stimulate this interest than lively competition in dressed carcass contests such as were inaugurated at the last Territorial Fair. It puts before the eye of the breeder in concrete form the results of his efforts at improvement; it enables him to form a standard of excellence in the carcass itself and shows him where improvement is necessary and desirable. If he is grain finishing his stock it gives him a certain basis of calculation as to whether he is feeding at a profit or at a loss.

The great development already registered in the live stock industry of this Territory has yielded millions of pounds of meat and put hundreds of thousands of dollars into the pockets of

the producers; it has helped more than any other one thing to make these islands self-supporting, but it has been accomplished by large outlays of money and the untiring efforts of the breeders and they will only receive the fullest returns on their investments when they are paid on a basis of quality in the meat which they produce.

It is very doubtful whether at the present time the most economical methods of feeding are being followed. Certain it is that the results of the dressed carcass contests recently held clearly demonstrate that corn, at the present market prices, cannot be profitably converted into meat. Considering that the best grass fed cattle here compare very favorably with the best stall fed cattle on the mainland, both in dressing percentage and quality of flesh, and considering the great demand for wheat substitutes, it is hardly justifiable to feed grain for meat production.

The ultimate object of every breeder of market animals is the production of more and better meat; to be able to market two animals of higher quality where one was marketed before. This is to be accomplished not by carrying a larger number of animals but by raising heavier, earlier-maturing animals showing a high degree of quality and this will naturally follow rigid selection of breeding stock. Only those sires should be used whose symmetry to form and outstanding points of quality and pure breeding fill the eye of the breeder and who have above all the ability to transmit these points to the largest number of his offspring. Theoretically, the progeny should inherit its characters in equal proportion from each parent, but practically this rarely if ever happens and it is the sire we look to for the upbuilding and improvement of the herd.

The measure of the breeder's success will be accurately recorded in the performance, if this term may be so used, of his stock at the abattoir and on the block. Here it will be noticed whether excessive waste has been eliminated and whether or not an evenly balanced, well nourished carcass carrying a high percentage of most valuable cuts has been produced. It will also show the lines along which improvement should be made. These records should not be overlooked by breeders as they offer a most valuable help in the improvement of the herd. There is an old saying that "the proof of the pudding is in the eating," and it is equally true that the proof of the improvement in the market class of live stock is in the quality of the dressed carcass produced.

A beginning has already been made in the collection of data on the above-mentioned points upon which a standard of excellence may be based and interesting results have even now been obtained. As time goes on much valuable data will be obtained which should be taken advantage of by every breeder.

In the last carcass contest, comparison in the steer class was confined to two entries, one a practically pure bred polled angus and the other a grade durham. One has been grain finished for the market and the other was from range pasturage. The results were as follows:

## STEER CARCASS NO. I.

Breed.....	Grade—Durham
Age.....	4 years
Feeding.....	Grass fed
Live weight.....	1239 lbs.
Dressed weight.....	765 lbs.
Dressing percentage.....	61.743%
Dressed weight after 48 hrs. chilling.....	75.2 lbs.
Loss in shrinkage.....	13 lbs.
Percentage in shrinkage.....	1.8%

Weight of caul fat.....	10	lbs.
“ “ tripe.....	27.5	“
“ “ liver.....	11.5	“
“ “ tongue.....	7	“
“ “ cheek meat.....	8	“
“ “ heart meat.....	4	“
“ “ green hide.....	94	“
“ “ tail.....	2.5	“
“ “ suet and kidneys.....	6	“
“ “ hind quarters.....	341.5	“
“ “ fore quarters.....	410.5	“

Weight of different cuts and percentage of same:

<i>Cuts.</i>	<i>Weight.</i>	<i>Percentage.</i>
Rounds.....	190 lbs.	25.2 %
Chucks.....	156 “	20.7 %
Loins.....	122.5 “	16.2 %
Plates.....	106.5 “	14.1 %
Cross ribs and shanks.....	76.5 “	10.17%
Ribs.....	65 “	8.6 %
Flanks.....	18 “	2.39%
Skirt steaks.....	6.5 “	0.86%.
Tail, suet and kidneys.....	8.5 “	1.13%

## STEER CARCASS NO. II.

Breed.....	Polled Angus
Age.....	4 years
Feeding.....	Stall fed, principally corn
Live weight.....	1572 lbs.
Dressed weight.....	977 lbs.
Dressing percentage.....	62.15%
Dressed weight after 48 hrs. chilling..	962 lbs.
Loss in shrinkage.....	15 lbs.
Percentage of loss in shrinkage.....	1.6%

Weight of caul fat.....	34	lbs.
“ “ tripe.....	36	“
“ “ liver.....	19	“
“ “ tongue.....	8	“
“ “ cheek meat.....	7.5	“
“ “ heart meat.....	6	“
“ “ tail.....	2.75	“
“ “ suet and kidneys.....	20.5	“
“ “ green hide.....	86	“
“ “ hind quarters.....	452	“
“ “ fore quarters.....	410	“

Weight of the different cuts and percentage of same:

<i>Cuts.</i>	<i>Weight.</i>	<i>Percentage.</i>
Rounds.....	212.5 lbs.	22.03%
Chucks.....	184.5 “	19.17%
Loins.....	183.5 “	19.07%
Plates.....	137 “	14.24%
Cross ribs and shanks.....	87.5 “	9.09%
Ribs.....	91.5 “	9.51%
Flanks.....	28.75 “	2.98%
Skirt steaks.....	9.25 “	0.96%
Tail, kidneys and suet.....	23.25 “	2.41%

The weights and percentages above tabulated clearly demonstrate the superiority of Steer No. 2. The dressing percentage while good does not show as high as should reasonably be expected in a grain finished animal. The carcass was very well balanced, the difference in weight between the quarters being placed in the hind quarters where it should be. In Steer No. 1 this difference of weight was placed in the fore quarters. A comparison of these weights reveals the fact that while the fore quarters in each animal weighed practically the same the hind quarters of Steer No. 2 were one hundred and ten pounds heavier. In other words, there was one hundred and ten pounds more flesh placed on that part of the carcass containing the most valuable cuts which was the direct result of superior breeding.

A comparison of weights of the heart and tripe showed Steer No. 2 to be a distinctly superior animal in constitution and powers of assimilation, two factors of utmost importance to the breeder in deciding whether or not an animal can be maintained at a profit. This animal showed a well turned carcass, even distribution of cover fat and a well marbled condition of the meat; the flesh was of fine quality, all of which goes toward producing a high degree of palatability.

Steer No. 1 was considerably coarser throughout; there was little evenness in the distribution of fat and lean and considerable waste through large coarse bones. Not near as profitable an animal from the consumer's standpoint. Yet from the present system of marketing, the producer received the same price per



pound. This will be corrected in time, otherwise the breeder will never receive the full remuneration his efforts deserve.

Both steers should have been marketed as three-year-olds or younger and the breeders would have realized an additional profit by so doing. The market here demands a younger and lighter weight animal than Steer No. 2. The preference is given to carcasses two and a half to three years old dressing from 750 to 800 pounds. Steer No. 1 met these requirements in weight only and had it had the superior quality incident upon good breeding, so evident in carcass No. 2, it would have been the more desirable animal.

Markets everywhere are showing preference for the early maturing, medium weight carcass showing a high degree of excellence in balance and even distribution of fat and lean and every breeder should aim to produce such. It means the production of more and better meat without increased cost.

#### SWINE CONTEST.

In the swine class, competition was much keener. Three breeders represented by a total of six entries competed. Two of the entries were swill fed, the balance grain fed. Three breeds were represented—Berkshire, Hampshire and Duroc-Jersey—all being pure bred with the exception of Entry No. 6, which was a Duroc-Berkshire cross.

The carcasses presented a very uniform appearance right through and offered a problem for the exercise of keen judgment.

The weights, cuts and percentages of these entries are given below:

#### HOG CARCASS, NO. I.

Breed.....	Duroc-Jersey
Feeding.....	Corn fed
Live weight.....	193 lbs.
Dressed weight.....	163 lbs.
Dressing percentage.....	84.4%
Weight after 48 hours chilling.....	159 lbs.
Loss in shrinkage.....	4 lbs.
Percentage shrinkage.....	2.5%

Weight of the different cuts and percentage of same:

<i>Cuts.</i>	<i>Weight.</i>	<i>Percentage.</i>
Hams . . . . . (2).....	32 lbs.	20.12%
Loins . . . . . (1).....	32.5 "	20.44%
Bellies . . . . . (3).....	19.5 "	12.26%
Shoulders . . . . . (4).....	14.75 "	10.77%
Head . . . . . (8).....	14.25 "	9.00%
Spare ribs . . . . . (5).....	4.75 "	2.09%
Leaf lard . . . . . (6).....	7.75 "	4.08%
Back fat . . . . . (7).....	28.05 "	18.0 %
Feet . . . . . (8).....	4.0 "	2.05%

## HOG CARCASS, NO. II.

Breed.....	Hampshire
Feeding.....	Corn fed
Live weight.....	182.5 lbs.
Dressed weight.....	151 lbs.
Dressing percentage.....	82.7%
Weight after 48 hours chilling.....	148.5 lbs.
Loss in shrinkage.....	2.5 lbs.
Percentage shrinkage.....	1.5%

Weight of the different cuts and percentage of same:

<i>Cuts.</i>	<i>Weight.</i>	<i>Percentage.</i>
Hams.....	32 lbs.	21.5 %
Loins.....	34.5 "	23.25%
Bellies.....	20.5 "	13.8 %
Shoulders.....	13.5 "	9.09%
Head.....	11.5 "	7.8 %
Spare ribs.....	4.0 "	2.7 %
Leaf lard.....	8.5 "	5.7 %
Back fat.....	20.5 "	13.6 %
Feet.....	4.0 "	2.7 %

## HOG CARCASS, NO. III.

Breed.....	Berkshire
Feeding.....	Corn fed
Live weight.....	186.5 lbs.
Dressed weight.....	153 lbs.
Dressing percentage.....	82%
Weight after 48 hours chilling.....	151.5 lbs.
Loss in shrinkage.....	1.5 lbs.
Percentage shrinkage.....	3.3%

Weight of the different cuts and percentage of same:

<i>Cuts.</i>	<i>Weight.</i>	<i>Percentage.</i>
Hams.....	28 lbs.	18.5 %
Loins.....	36 "	24.15%
Bellies.....	25.5 "	16.83%
Shoulders.....	13.25 "	8.74%
Head.....	13.5 "	8.91%
Spare ribs.....	4.0 "	2.64%
Leaf lard.....	8.25 "	5.11%
Back fat.....	18.5 "	12.2 %
Feet.....	3.75 "	2.4 %

## HOG CARCASS, NO. IV.

Breed.....	Duroc-Jersey
Feeding.....	Corn fed
Live weight.....	219 lbs.
Dressed weight.....	182 lbs.
Dressing percentage.....	83.0%
Weight after 48 hours chilling.....	179 lbs.
Loss in shrinkage.....	3 lbs.
Percentage shrinkage.....	1.7%

Weight of the different cuts and percentage of same:

<i>Cuts.</i>	<i>Weight.</i>	<i>Percentage.</i>
Hams.....	34.5 lbs.	19.27%
Loins.....	45.5 "	25.42%
Bellies.....	26 "	14.25%
Shoulders.....	15.5 "	8.6 %
Head.....	16.0 "	8.9 %
Spare ribs.....	4.25 "	2.37%
Leaf lard.....	8.75 "	4.88%
Back fat.....	23.0 "	12.38%
Feet.....	4.25 "	2.37%

## HOG CARCASS, NO. V.

Breed.....	Duroc-Jersey
Feeding.....	Swill fed
Live weight.....	219.5 lbs.
Dressed weight.....	184 lbs.
Dressing percentage.....	84.3%
Weight after 48 hours chilling.....	182 lbs.
Loss in shrinkage.....	2 lbs.
Percentage shrinkage.....	1.1%

Weight of the different cuts and percentage of same:

<i>Cuts.</i>	<i>Weight.</i>	<i>Percentage.</i>
Hams.....	37 lbs.	20.33%
Loins.....	40.5 "	22.25%
Bellies.....	22.5 "	12.36%
Shoulders.....	18.5 "	10.16%
Head.....	17.5 "	9.6 %
Spare ribs.....	4.75 "	2.6 %
Leaf lard.....	9.25 "	5.08%
Back fat.....	26.5 "	14.6 %
Feet.....	4.75 "	2.6 %

## HOG CARCASS, NO. VI.

Breed.....	Berkshire cross
Feeding.....	Swill fed
Live weight.....	193.5 lbs.
Dressed weight.....	165 lbs.
Dressing percentage.....	85.27%
Weight after 48 hours chilling.....	163 lbs.
Loss in shrinkage.....	2 lbs.
Percentage shrinkage.....	1.25%

Weight of the different cuts and percentage of same:

<i>Cuts.</i>	<i>Weight.</i>	<i>Percentage.</i>
Hams.....	32 lbs.	20.00%
Loins.....	39.5 "	24.23%
Bellies.....	24.5 "	15.03%
Shoulders.....	14.75 "	9.05%
Head.....	14.75 "	9.05%
Spare ribs.....	4 "	2.4 %
Leaf lard.....	5.25 "	3.22%
Back fat.....	23.25 "	14.1 %
Feet.....	3.5 "	2.16%

In studying the above tabulations the closeness of the contest is very evident. All awards were based upon the dressed weight percentage and the percentage of the three most valuable cuts, i. e., hams, loins and bellies.

That the first award fell to a swill fed hog was a surprise and entirely unexpected, yet this animal showed a better profit to the breeder, even at an equal food cost, and a better profit to the market. Figures conclusively demonstrate that larger profits accrue to both breeder and market from the medium weight hogs. Carcasses dressing from 150 to 165 pounds are in greater demand because of the larger profits realized by the market and the earlier and cheaper these weights can be attained together with less waste through dressing the greater will be the profits to the breeder.

In comparing the above percentages it will be seen that the swill fed hogs dressed out better, that is, there were less amounts of offal, and showed less loss through shrinkage in cooling which speaks highly for this class of hog. They also stood high in amount of cuts.

We have no data at hand from which to compile statistics giving the actual profit realized by the breeders of the six carcasses entered in this contest, but there is no question that the above weights were produced most cheaply in the swill fed animals. It is to be hoped that in future contests of this nature



such data as above referred to will be at hand for it is of inestimable value to the feeder as a basis for estimating his profit or loss. Unless he knows the actual cost of his feed and, in the case of grain, its market value as such and also the amount of pork a certain amount of such feed will produce, he is in the dark and it might be costing him fifty cents to produce that for which he is only receiving twenty-seven cents.

We confidently expect to see a larger number of breeders enter stock in these contests next year, as it is through such means that breeders can best demonstrate their ability to supply the demands of this Territory with a high class article.

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## Kokee Camps

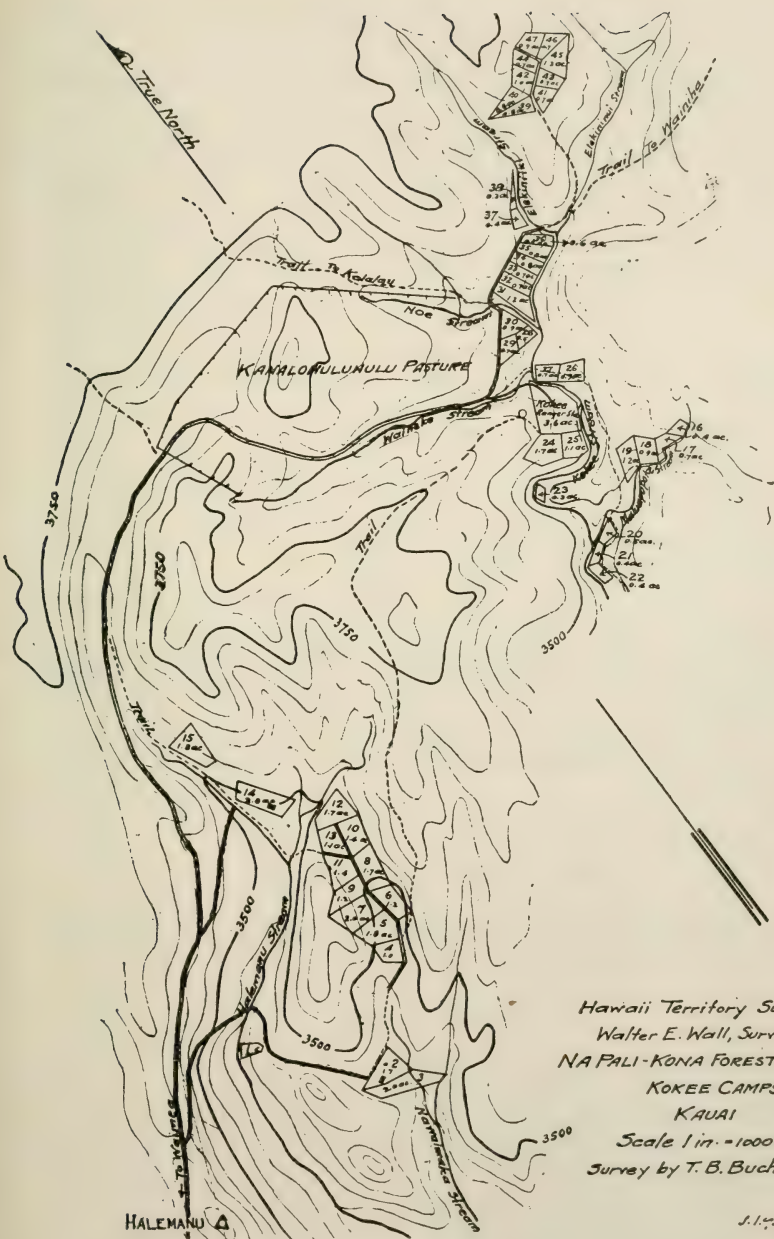
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In his speech on the occasion of the inauguration of Hon. C. J. McCarthy as Governor of Hawaii on July 22, 1918, Hon. Franklin K. Lane, Secretary of the Interior, said in part as follows:

"When the old kings gave up their lands to their chiefs they ran the property lines from the sea to the mountain. This was their easiest and perhaps their only way of dividing the lands. It has, however, a peculiar suggestion for us. Those who live in lower altitudes need the change in air that comes with the ascent to the mountains, and I am in hope that out of your public lands, and out of the generosity of those who have so much and have given so much toward public purposes in this territory, there will be reserved on every island mountain a public park where those may resort who come from the lands below, where the transient may pass the night, or those who wish may have their cottages, which should be held under license which will prevent the park from becoming absorbed into private ownership. As the man of wealth now wisely has his hill house and his seaside house, so should there be reserved for those of more modest means some opportunity to gain the advantages of the rarer, cooler air of higher altitudes. This, however, should not be attempted at haphazard, but under plans carefully thought out and under a management and control that will be wise, independent and public spirited."

This Board has attempted to plan out just such a scheme in the high mountain region back of the Waimea Canyon on lands in the Na Pali-Kona Forest Reserve, Kauai, which came into the control of the Board last December by lease expiration and is now prepared to issue temporary permits of not more than five years' duration for camping privileges under certain terms and conditions.

The need for an available locality in a cooler climate amidst



pleasant surroundings where those living in the low lands may go for the recuperation of bodily energy and of spirit has been recognized and it is believed that the plan which has been evolved will permit of this without interference with the main purposes for which the forest reserve in this region was set aside.

Along the small streams of Kokee and Halemanu a series of 47 camp sites have accordingly been surveyed out, and these vary in size from .3 to 2.0 acres. As a rule they are situated in open meadow land at the bottom of the shallow valleys which dissect this high plateau region at the general elevation of 3,500 feet above the sea. The rainfall here is not excessive and on account of the elevation the nights as a rule are quite cool.

A great variety of scenery, from picturesquely colored and curiously eroded cliffs in the adjacent Waimea Canyon to miles and miles of heavy native forest, surrounds the Kokee Camps which may now be reached by automobile if the rider is not particular as to the smoothness of road travel.

For unimproved camp sites an annual rental on the basis of twenty-five dollars per acre is charged. With the permit each occupant will be required to furnish a bond in the sum of five hundred dollars to insure faithful compliance with the conditions required to be observed by the permit.

In addition to the camp sites under permit there are additional areas where transients may camp for a night or two.

A sample copy of the permit form is printed herewith for the information of the public as well as a map showing the situation of the camp.

Further information and application forms for the permits may be obtained from the Superintendent of Forestry, P. O. Box 207, Honolulu.

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## TERRITORY OF HAWAII.

### BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY, DIVISION OF FORESTRY.

#### CAMPING PERMIT.

Permission is hereby granted to.....  
of.....to occupy camp site No.....  
of the Kokee Camps within the Na Pali-Kona Forest Reserve,  
Kauai, as shown on the attached blueprint map, for a period of  
five (5) years from....., subject to  
the following conditions and regulations:

1. The permittee shall pay to the Board of Agriculture and  
Forestry in consideration for this occupancy, the sum of.....  
..... for the period from.....

to December 31, . . . . ., and thereafter annually, on the first day of January, the sum of . . . . .

2. The charges for this use may be readjusted whenever necessary, in the opinion of the Board of Agriculture and Forestry, to place this permit on a basis consistent with the charge to other permittees for like privileges or for any other reason.

3. Occupancy or use under this permit shall begin within six (6) months and shall be exercised at least 14 days each year, unless the time is extended or shortened.

4. Improvements to the value of One Hundred Dollars (\$100) shall be made on the premises within eighteen months and maintained in good order and repair during the term of this permit.

5. Upon the abandonment, termination or revocation of this permit, and in the absence of an agreement to the contrary the permittee, if all the rental charges due the Government have been paid, may, within thirty (30) days or such further time as may be granted by the Superintendent of Forestry, remove all structures which have been placed on the premises by him, since the date of issuance of this permit, except where the permitted material was secured from the local forest, but upon failure to remove the structures within that period they shall become the property of the Government.

6. The permittee shall comply with all rules and regulations of the Board of Agriculture and Forestry and with all laws of the Territory of Hawaii applicable to Forestry, shall observe all sanitary laws and regulations applicable to the premises and shall keep the premises in a neat, orderly and sanitary condition.

7. The permittee shall take all reasonable precaution to prevent and suppress forest fires.

8. The permittee shall not cut or destroy any live timber without first obtaining a permit from the Superintendent of Forestry, and no houses or cabins shall be constructed of green logs.

9. The permittee shall pay the Board of Agriculture and Forestry for any damage resulting from this occupancy.

10. All refuse shall be burned in a safe place or shall be deposited in a pit dug in the ground, at least 150 feet from any stream. These pits to be covered with earth before leaving the camp for any length of time.

11. A sanitary and fly-proof privy vault and a thoroughly sealed cesspool of adequate size to care for all bath, sink and waste waters shall be constructed by the permittee on a suitable location which shall be not less than 150 feet from any stream.

12. No plant life of any nature or seeds for planting shall be brought into this forest reserve except by special permission from the Superintendent of Forestry, who shall have the same inspected and, if necessary, fumigated before being taken into the forest reserve. The permittee shall clear and keep clear



this camp site of lantana and other tall and obnoxious weeds.

13. No horse or milch cow shall be turned loose for grazing in the forest reserve, but shall be either tethered out in open areas or pastured in existing enclosures.

14. No trails shall be cut or dug through the forest except by special permission from the Superintendent of Forestry.

15. A general right-of-way is hereby reserved across this lot for travel on the most convenient route.

16. This permit may be transferred with the approval of the Superintendent of Forestry, subject to such conditions as may be imposed at the time of transfer. It shall terminate upon breach of any of the conditions herein or at the discretion of the Superintendent of Forestry. Upon the termination of this permit all rights and privileges given or granted thereby or thereunder shall forthwith cease and terminate, except as herein otherwise provided.

.....  
Superintendent of Forestry.

Honolulu, T. H.

---

## By Authority

---

### APPOINTMENT OF FIRE WARDENS.

---

Notice is hereby given that under the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, the following persons were, on July 16, 1918, appointed District Fire Wardens:

#### KAUAI.

L. D. LARSEN, in and for the District of Koolau, excepting the land of Anahola. To replace J. R. Myers, resigned.

E. M. CHEATHAM, in and for the portion of the Districts of Koolau and Puna, extending from the land of Anahola to the land of Oloheua, inclusive. To replace G. P. Wilcox, moved away.

C. H. WILCOX, in and for the portion of the District of Puna, south of and including the land of Wailua. To replace F. Weber, moved away.

B. D. BALDWIN, in and for that portion of the District of Kona lying between and including the Waimea, Poomau, and Kauaikinana Valleys on the west and the Hanapepe Valley on the east. To replace Francis Gay, resigned.

#### OAHU.

W. H. CLEGHORN, in and for that portion of the District of Koo-

laupoko, extending from the Koolauloa District line to the land of Heeia. To replace Frank Pahia, resigned.

WM. HENRY, in and for that portion of the District of Koolaupoko, extending from and including the land of Heeia to the land of Kailua. To replace Otto Ludloff, moved away.

WM. WEINRICH, in and for that portion of the District of Ewa lying to the west of the main government road. To replace W. F. Dillingham, resigned.

#### MAUI.

A. W. COLLINS, in and for the District of Lahaina. To replace L. Weinzheimer, moved away.

C. E. S. BURNS, in and for the District of Wailuku. To replace Andrew Gross, moved away.

#### HAWAII.

A. W. CARTER, in and for the District of South Kohala. To replace O. L. Sorenson, moved away.

W. P. NAQUIN, in and for the western part of the District of Hamakua extending to the west from the boundary of the land of Paauhau to the boundary of the land of Kukaiau. To replace Alexander Morrison, moved away.

JAMES CAMPSIE, in and for that portion of the District of Kau extending from the Puna District line to and including the land of Punaluu. To replace W. G. Ogg, deceased.

R. A. McWAYNE, in and for that portion of the District of Kona extending from the Kau District line to and including the land of Kaapuna. To replace R. von S. Domkowiez, moved away.

L. P. LINCOLN, in and for that portion of the District of Kona extending from the land of Hookena to and including the land of Kaawaloa. To replace J. D. Paris, deceased.

---

#### BY AUTHORITY.

---

#### APPOINTMENT OF DISTRICT FORESTERS.

Notice is hereby given that under the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, the following persons were, on July 16, 1918, appointed District Foresters:

#### KAUAI.

L. D. LARSEN to replace J. R. Myers, moved away.

C. H. WILCOX to replace F. Weber, moved away.

B. D. BALDWIN to replace Francis Gay, resigned.

#### MAUI.

A. W. COLLINS to replace L. Weinzheimer, moved away.

#### HAWAII.

W. P. NAQUIN to replace A. Ahrens, moved away.

JAMES CAMPSIE to replace Julian Monsarrat, resigned.

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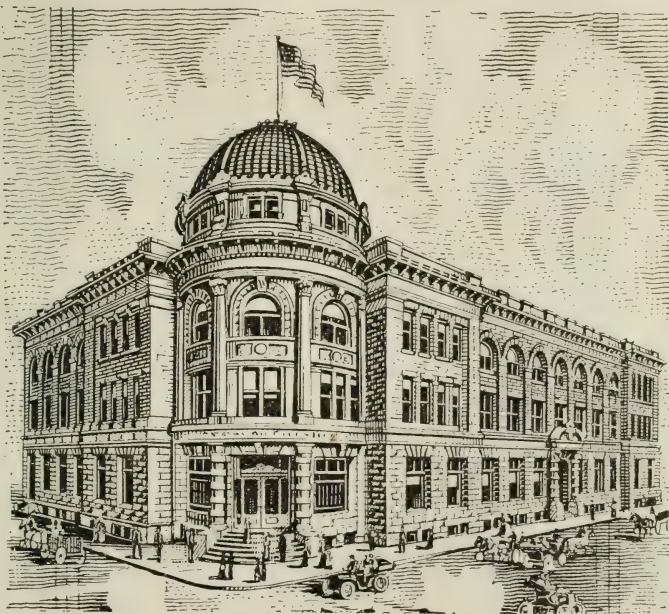


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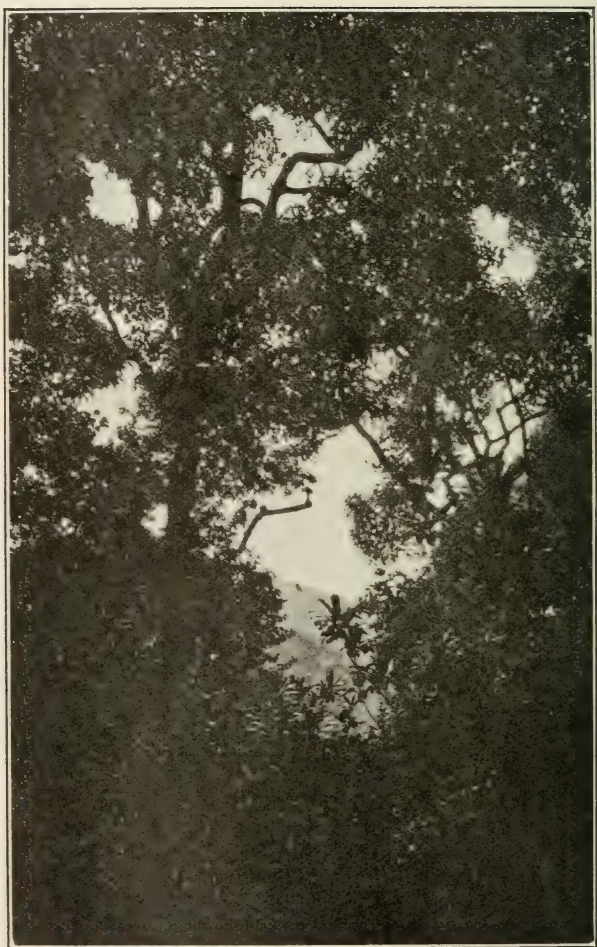
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

SEPTEMBER, 1918

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All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

HONOLULU, SEPTEMBER, 1918.

No. 9

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The Division of Forestry continues to pursue its campaign of fencing forest reserve boundaries where needed to prevent stock from damaging the native woods. This includes the enforcement of fencing required by Government leases as will be seen by the current report of the Superintendent of Forestry.

The Division of Entomology is assisting the small farmer in the Territory by breeding and distributing beneficial insects which prey on the crop pests.

The trimming out of trees along the Tantalus road in the eucalyptus forest has allowed the sun to reach the roadbed with the result that this highway is once more passable for motor cars.

The work of eradicating bovine tuberculosis from the dairy herds in the Territory continues with good results.

The Board of Supervisors of the County of Kauai have generously come to the aid of this Board by continuing financial assistance in such a manner that the anthrax infested area can be watched satisfactorily.

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## Division of Forestry

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Honolulu, Hawaii, August 26, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of July, 1918:

### FOREST FENCING.

Ranger Lindsay on July 17 began the construction of the forest fence where needed on the boundary of the new addition to the Makawao Forest Reserve on Maui. This new fence when



completed will be .85 mile long, and in addition an existing fence will be repaired so as to keep cattle from getting into the reserve.

On the makai boundary of the Waianae-kai Forest Reserve, Oahu, a fence .22 mile long was completed during the month so as to keep the George Holt cattle from getting into the reserve. This work included the placing of a gate across the road at the power house, permission for the erection of which was first obtained from the Board of Supervisors of the County.

The attention of the Land Commissioner was called to the fact that the fence at Kiolakaa on the boundary of the Kau Forest Reserve, Hawaii, required to be kept in good repair by General Lease No. 550 to the Hutchinson Sugar Plantation Co., had, on advice received from Ranger Mackenzie, not yet been repaired.

The makai boundary of the Kuliouou Forest Reserve, Oahu, was located on the ground with the aid of a government surveyor and forest reserve monuments were placed on the two corners between which a fence is required to be built by General Lease No. 837 to Club Stables, Limited, but which has not yet been constructed.

As instructed at a recent meeting of the Board, I called on Governor McCarthy and laid before him the present situation in regard to fencing requirements in general leases of the Territory which had not been fulfilled. He appeared to be disposed to correct the situation and said that if a few of the leases were cancelled for non-compliance with the fencing clause the other leaseholders would promptly come to time. In accordance with his request, I set forth the present situation in the form of a letter, a copy of which is herewith presented.

#### NEW RESERVES.

Several days were spent with a government surveyor running out the line of the proposed new Hauula Forest Reserve, Oahu, where it crosses the private lands of Kahana. This completes the field work on this project which will be presented for approval at an early date.

A government surveyor has been running out the makai boundary line of the Lihue-Koloa Forest Reserve, Kauai, where it crosses the government land at Wailua to determine the location of the forest fence and the official boundary with a view to changing the latter to the actual fence line.

#### TREE PLANTING.

On Kauai, Ranger Lovell planted 298 swamp mahogany and 97 silk oak trees on the Kamalomaloo flats.

The Mikilua nursery house in the Lualualei Forest Reserve, Oahu, was completed during the month and preparations were completed for beginning the planting work early in August.

## MISCELLANEOUS.

The Makiki planting gang spent several days in trimming out the trees which overhang the Tantalus road in the eucalyptus forest and in making minor repairs to the road so as to make it passable for our work. In this, assistance was rendered by several grass cutters who are allowed to take honohono from the lower part of the forest.

Assistance and advice was given by the Forest Nurseryman and myself to Mrs. A. G. M. Robertson who, as the representative of the Outdoor Circle, has undertaken to begin the improvement of the Round Top Forest Reserve, Oahu, by setting out with prison labor trees, shrubs and vines, a part of which have been furnished by the Government Nursery.

One day was spent in inspecting the improvement thinnings in the algaroba forests at Nanakuli and Lualualei, Oahu, which are under license from the Land Office to the Sandwich Islands Honey Co. The cuttings were found to be satisfactory and the new method, which I suggested, of burning the brush while still green, is working out very well.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## FENCING CLAUSE IN GENERAL LEASES.

Honolulu, Hawaii, August 6, 1918.

Hon. Charles J. McCarthy,  
Governor of Hawaii,  
Honolulu.

SIR:—In accordance with my verbal promise to you of July 29, and as directed by the Board of Commissioners of Agriculture and Forestry at its meeting of July 16, I have the honor to present to you on behalf of this Board the following situation in regard to the non-fulfillment of fencing clauses in General Leases of the Territorial Land Office and to request your assistance in remedying the present unsatisfactory condition.

There are four of such cases which have particularly come to the attention of this Board and these are as follows:

1. GENERAL LEASE NO. 730 to L. L. McCANDLESS of all the Government Remnants of the lands of Makua, Kahanaiki and the Government interest in Keawaula, Waianae, Oahu. Fencing adjoining the Makua-Keaau Forest Reserve not yet built.

2. GENERAL LEASE NO. 837 to CLUB STABLES, LIMITED, of all the Kuliouou Pasture Land, Oahu. Fence adjoining the Kuliouou Forest Reserve not yet built.
3. GENERAL LEASE NO. 792 to CHAS. A. RICE of Pasture Lot No. 1, Papaa-Moloaa Tract, Kawaihau, Kauai. Fence adjoining the Moloaa Forest Reserve built but not maintained in good repair.
4. GENERAL LEASE NO. 550 to the HUTCHINSON SUGAR PLANTATION COMPANY of the lands of Kiola-kaa-Puueo. Fence on the Kau Forest Reserve boundary built but not maintained in good repair.

1. The situation at Makua is covered rather fully on pages 2 to 5 of the enclosed copy of a letter of the Superintendent of Forestry of June 3, 1918, to this Board. The resolution referred to was duly passed by the Board at its meeting of June 6, and transmitted to the Commissioner of Public Lands the same day, but upon recent inquiry of said Commissioner I was informed that practically nothing has been done to enforce the fencing requirement since the receipt of this resolution.

As stated in the enclosed letter of June 3, every drop of fresh water at Makua is at a premium and this will be especially true when in the future the land may be homesteaded. At the present time there is a good crop of sweet potatoes growing on the large flat near the middle of Makua Valley on the leased land, which would indicate the possibility of using this land for homestead purposes. At the present time, Mr. McCandless also has a pipe line which conveys water from the forest reserve to this cultivated flat.

Enclosed herewith are some photographs showing the native forest in the Makua-Keaau Forest Reserve which is being damaged by Mr. McCandless' cattle, which being unrestrained by any fence on the forest reserve boundary run at will in the accessible places. It is important, therefore, on account of this water situation to protect the native forests by insisting upon the building of this fence in order to protect what is left of the forest and to encourage its increase by natural means.

2. The situation at Kiliouou is quite similar in that the forest reserve fence has never been built. The distance of the necessary fence on the makai boundary of the Kuliouou Forest Reserve is only 1917 feet, and was required to be built by the following clause in General Lease No. 837:

"The Lessee shall construct at his own expense within one year from November 4, 1913, a lawful fence as defined by Sec. 407, Revised Laws of Hawaii, along the entire boundaries of the land, herein demised, and adjoining the Forest Reserve and maintain said fence in good repair during the term of this Lease."

The Kuliouou Forest Reserve was proclaimed on February 13,



1914, and on account of the absence of this fence the cattle pasturing on the adjacent leased lands are continually trespassing on the forest reserve and are doing damage to the native forests. This situation was called to the attention of the Commissioner of Public Lands on April 9, 1917, and soon thereafter he communicated with the Club Stables, Limited, the present holders of this lease, and requested them to comply with the conditions of their lease immediately. I have just returned from an inspection of this line and find that absolutely nothing has been done toward the building of this fence.

3. The fence on the boundary between the land covered by General Lease No. 792 and the Moloaa Forest Reserve was originally constructed, as required by the following clause:

"The Lessee shall construct at his own expense within one year from November 1, 1912, a lawful fence as defined by Sec. 407, Revised Laws of Hawaii, along the entire boundaries of the land herein demised, and adjoining the Forest Reserve, and maintain said fence in good repair during the term of this Lease."

In the construction of this fence local material was used for posts and a recent inspection disclosed the fact that a great many of the posts had rotted and that the fence was flat on the ground allowing cattle to wander at will into the reserve. This situation was called to the attention of the Commissioner of Public Lands on May 28, 1918, with the request that he require the lessee to maintain this fence in good condition, but so far as I have been able to ascertain recently the only step that has been taken to remedy the situation has been the driving out of the cattle from the reserve. In order to protect the forest adequately the fence should be repaired at once and maintained in good stock-proof condition.

4. Only a short stretch of fence is involved in this case and this consists of repairing an existing fence on the Kau Forest Reserve boundary. The clause in General Lease No. 550 requiring the maintenance of this fence is as follows:

"It is also further provided, that the Lessees, their executors, administrators and assigns will not suffer to be made any fires on said lands which will injure or endanger the forest thereon, and will use every endeavor to protect and encourage the growth of forest and underbrush now upon said land, and renew same in places where it is absent or shall appear to be in process of diminution, and will not permit any live stock to run at large on said land, and at their own cost, and expense within a reasonable time after the date hereof, shall build and maintain a fence along its boundary, as above described; excepting such courses and distances as described in Sections 9, 10 and 11, hereof, but shall continue said fence line along the boundaries of the Ahupuaa of Ka-



huku, Kau, and the public lands of Waiohinu and Hionaa and to connect with the present fence of the Hawaiian Agricultural Co. at the N. W. corner of the land of Kaa-laiki."

The matter was first called to the attention of the Commissioner of Public Lands on September 24, 1917, and again on April 17, 1918, but the latest report from my forest ranger, dated July 1, 1918, is to the effect that this fence has not yet been repaired. Proper fencing in this region is important because of the fact that the water supply of Waiohinu Village is involved and should be protected from damaging stock.

Enclosed herewith also is a copy of a reprint which gives the basic reasons why the native forest in the reserve should be protected from stock, and why this Board is so vigorously insisting on the compliance by the holders of government leases with fencing clauses contained therein.

Very respectfully,

C. S. JUDD,  
Executive Officer.

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## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, August 30, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR:—I herewith submit a report of the principal work done during the month of July:

### NURSERY.

#### *Distribution of Plants.*

	In transplant boxes.	Pot grown.	Total.
Sold . . . . .	50	183	233
Gratis . . . . .	1390	496	1886
	<hr/> 1440	<hr/> 679	<hr/> 2119

### COLLECTIONS.

Collections on account of plants sold. . . . .	\$ 5.20
Rent of Office Building, Nursery grounds for April and May . . . . .	70.00
	<hr/> \$75.20

## PLANTATION COMPANIES AND OTHER CORPORATIONS.

Under the above heading 300 pot grown plants were distributed. We received orders during the month for 40,000 seedlings to be delivered during the month of September.

## MAKIKI STATION.

The work at this station has been principally routine. We are collecting logs of all the different kinds of trees to be found around Honolulu on Tantalus. The logs will be cut up into fence posts, box shooks, laths, etc., and will be tested in regard to durability. Wood specimens will also be cut for reference purposes.

## HONOLULU WATERSHED PLANTING.

A commencement has been made to cut out and trim the trees along the Tantalus road that runs through the Makiki forest. Complaints have been made by people using the road that the dense shade caused by the trees kept the road always wet and consequently unfit for ordinary traffic. We have started at the bottom of the forest and intend carrying the work right through to the top. When we get finished there will be no cause left for complaint, as far as the trees are concerned, and it will be up to the County officials to put the road in good condition.

## ADVICE AND ASSISTANCE.

The writer has been requested to make calls and otherwise give advice and assistance as follows:

Calls made . . . . .	7
Advice by letter . . . . .	4
Advice by telephone . . . . .	8
Advice at Nursery . . . . .	10

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

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## Division of Entomology

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Honolulu, Hawaii, August 9, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month of July the insectary handled 21,900 pupae of the melon fly, from which there were bred 2,311 females and 2,072 males, *Opius fletcheri*.

The distribution of parasites was as follows:

*Opius humilis.*

Oahu :	Females.	Males.
Manoa . . . . .	60	25
Kaimuki . . . . .	35	10
Maui :		
Haiku . . . . .	30	30
Hawaii :		
Hilo . . . . .	95	30

*Diachasma tryoni.*

Oahu :		
Kaimuki . . . . .	360	125
Manoa . . . . .	165	90
Maui :		
Haiku . . . . .	50	20
Hawaii :		
Hilo . . . . .	250	80

*Spalangia cameroni.*

Maui :		
Paia . . . . .	...	1,550

*Opius fletcheri.*

Oahu :		
Kaimuki . . . . .	250	95
Moanalua . . . . .	1,150	980
Aiea . . . . .	315	210
Makiki . . . . .	350	200
Hawaii :		
Hilo . . . . .	100	40
Kapoho . . . . .	100	70

*Tetrastichus.*

Oahu :		
Manoa . . . . .	...	100

*Paranagrus Osborni.*

Oahu :		
Makiki Nursery . . . . .	...	8,900
Aiea . . . . .	...	200
Maui :		
Wailuku . . . . .	...	2,400
Paia . . . . .	...	3,900
Hawaii :		
Kapoho . . . . .	...	1,900
Kauai :		
Kalaheo . . . . .	...	3,800

Respectfully submitted,

DAVID FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, July 31, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of July, 1918, as follows:

During the month there arrived at the port of Honolulu forty-nine vessels, of which 19 carried vegetable matter with the following results:

<i>Disposal.</i>	<i>Lots.</i>	<i>Parcels.</i>
Passed as free from pests.....	577	11,187
Fumigated . . . . .	6	6
Burned . . . . .	33	33
Total inspected . . . . .	616	11,226

Of these shipments 11,031 packages arrived as freight, 119 packages as mail and 76 packages as baggage.

### RICE AND BEAN SHIPMENTS.

During the month 42,524 bags of rice and 2,486 bags of beans arrived from Japan and Oriental ports, all of which were free from pests.

### PESTS INTERCEPTED.

Approximately 4,758 pieces of foreign baggage belonging to passengers and immigrants were examined and from which were seized and destroyed by burning, 13 lots of fruit and 17 lots of vegetables.

The following disposal was made of plants and seeds from various sources:

On July 2, a case of orchids from Manila was fumigated with H. C. N. for some ants found in the packing.

On July 8, a bag of seed corn in the mail from Mexico was fumigated as a precaution.

On July 9, a case of banana sprouts and a case of *Discorea* yams from Manila, consigned to Wells Fargo Express Co. for the Hawaii Experiment Station, were found to be infested with a large colony of Termites (White ants). Immediate precautions were taken and the cases were securely wrapped in a tarpaulin and transferred to the fumigating room where they were subjected to fumigation with carbon bisulphide for 24 hours. Subsequent examination proved that all of the insects were killed.



The entire shipment with cases and packing were destroyed by burning.

This termite will probably prove to be the same species that is doing serious damage to the timber of the various docks and buildings throughout the city.

On July 9, a package of rice paddy from Manila by mail was fumigated as a precaution.

On July 16, a package of tree seed in the mail from Java was fumigated.

On the same date two packages of tree seed in the mail from Manila were fumigated as a precautionary measure.

On July 22, a case of peaches in baggage from San Francisco infested with Peach Moth were sorted and the infested fruit burned.

On July 30, a package of dried insects from Samoa was found to contain two sticks of sugar cane which were confiscated and burned.

#### HILO INSPECTION.

Brother M. Newell reports the arrival of five vessels, one of which carried vegetable matter consisting of 119 lots and 2,216 parcels. All of these were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Will J. Cooper, Plant and Fruit Inspector for Maui, reports the arrival of five vessels at the port of Kahului, two of which carried vegetable matter consisting of 50 lots and 343 packages, all of which were found to be free from pests.

#### INTER-ISLAND INSPECTION.

Fifty-seven steamers plying between Honolulu and other island ports were attended and the following shipments were passed as free from pests:

Taro.....	646	bags
Vegetables.....	208	packages
Plants.....	85	"
Fruit.....	63	"
		<hr/>
Total passed.....	1002	"

Six packages of plants and one package of pineapples were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

## Division of Animal Industry

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Honolulu, Hawaii, Sept. 10, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of July, 1918:

### THE ANTHRAX SITUATION ON KAUAI.

During the early part of the month a week was spent on Kauai for the purpose of arranging the quarantine restrictions at Hanalei in a way satisfactory to all concerned. In a special report dated July 15th, I have already detailed the results of these efforts, and though the same will not be consummated until next month, it may be stated here, that the rigid quarantine as hitherto enforced by guards will be discontinued in so far as certain unfenced districts and highways are concerned, while all fenced pastures and premises where anthrax has occurred will be plainly posted with penalty signs warning against trespassing. In dispensing with the guards it is expected that the supervisors will continue the appropriation thereby saved (\$250.00 per month) as part compensation for the continued services of the Deputy Territorial Veterinarian and for the employment of a mounted patrolman.

As already explained the complete expenditure of the anthrax appropriation would have necessitated that Dr. Golding's services be dispensed with after July 31st. To continue the guards at Kalihi-wai and Hanalei bridge without any official supervision would be futile. It was therefore pointed out to the Board of Supervisors that it was far more important to retain Dr. Golding than the guards; that the frequent deaths of cattle and horses on the Princeville Plantation required the presence of a veterinarian to determine the cause of death and supervise the disposal of the carcasses; that no live stock should enter or leave the infected district without official inspection; and finally that vaccination would have to be continued for an indefinite period.

These suggestions were subsequently embodied in a letter to the Board of Supervisors and a reply received that the matter would be considered at the next meeting of the Board, on August 7th.

While on Kauai I went with Dr. Golding to examine the carcass of a horse on the Princeville Plantation, some four miles mauka of the plantation stables. The horse belonged to an employee of the Kauai Electric Company and had been vaccinated some six weeks before. The owner had telephoned the manager of the ranch reporting the horse sick, and as Dr. Golding was with me at Waimea, he had the horse brought down to the

stables, where he injected it with 100 cc. anti-anthrax serum and sent it back mauka. The horse died a few hours after, between midnight and morning.

When I reached the ranch the manager had already visited the carcass and taken blood smears for microscopic examination. These proved to contain a very few bacilli strongly resembling anthrax, whereas there should have been millions had the animal actually died from this disease. It was therefore decided to examine the carcass. Here again a number of contrasting conditions were found. Though the animal had then been dead at least six hours, the carcass was in a condition of extreme rigor mortis. There was no bloody discharge from the natural openings. These two conditions would generally be considered sufficient to pronounce a negative diagnosis—not anthrax. The jugular vein was severed, and very dark blood containing distinct clots flowed out. Here again the first condition spoke for anthrax, the second against. So when the carcass was opened. The system was enlarged but not soft. There were some gelatinous exudations but not sufficient to be of diagnostic value or appearance. Smears were taken for microscopic examination and the carcass was then burned where it lay. The subsequent examination showed a very few anthrax-resembling bacilli. Had the animal died from an ordinary case of anthrax the blood would, six to eight hours after death, have been a seething mass of bacteria.

I have gone into detail in describing this case to show how difficult the diagnosis of anthrax can be at times. Also to show the inadvisability of taking a horse four miles, mostly up hill, after injecting 100 cc. of anti-anthrax serum.

#### BOVINE TUBERCULOSIS WORK.

From Hawaii Dr. Elliot, who has returned from the Coast much improved in health and who has resumed his duties with this Board, reports that he has tested all dairy animals in Hilo and vicinity, some 320 head, and found 12 reactors. These have been appraised, destroyed and compensation paid in the usual way.

From Maui, Dr. Fitzgerald reports 2 cows condemned at Lahaina.

On Kauai Dr. Golding will test the dairy stock on the northern part of the island, but until final arrangement has been made for his retention it has not been considered advisable for him to be absent from the Hanalei district for any length of time.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, August 21, 1918.

Doctor Victor A. Nörsgaard, Chief, Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu.

SIR:—I beg to submit the following report for the month of  
July, 1918.

## TUBERCULOSIS CONTROL.

The following dairy cattle were tested during the past month:

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
Waianae Plantation Co.....	32	31	1
H. Hackfeld & Co.....	5	5	0
Kamehameha Schools : . . .	47	47	0

A total of 84 head were tested out of which number 83 were  
passed and 1 condemned and branded.

Besides the above, post-mortem examinations were made on  
three cows condemned the month previous.

## CONTAGIOUS EPITHELIONA.

Several small outbreaks of this disease occurred among chick-  
ens and turkeys during the month and a total of 54 chickens and  
40 turkeys were given the vaccine treatment. 1000 cc. of chicken-  
pox vaccine was made up in the laboratory and distributed among  
the poultry raisers.

## LIVE STOCK IMPORTATIONS.

S. S. Sachem, San Francisco: 1 English bulldog, Wells  
Fargo Express Co.

S. S. Manoa, San Francisco: 1 dog (Dachshund), Mrs.  
Wisadeider.

S. S. Hyades, San Francisco: 2 dogs (collies), Wells Fargo  
Express Co.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.



# History of Botanical Exploration in Hawaii

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## INTRODUCTION.

There is probably no other region, of equal area, that has a history of scientific exploration and investigation more interest-

ing than that of the Hawaiian Islands. Since the English discovery of this isolated archipelago by Captain Cook in 1778, the islands have been repeatedly visited and explored by men of science from many countries and of many interests.

It is the purpose of the present paper to chronicle briefly the salient incidents in the history of botanical exploration in the Hawaiian Islands, from the earliest known time down to the beginning of the twentieth century. Particular attention is given to the visits of the earlier voyagers and investigators, as they possess the fresh charm of pioneer work. This characteristic compensates for their lack of comprehensiveness. The later work was more technical and intensive, but not so replete with human interest. The writer does not attempt an exhaustive historical dissertation, but to enumerate only the significant and outstanding facts concerning each explorer. The data have been collected from a wide range of sources, many of which are relatively inaccessible.

The observation is pertinent at this place that the primitive Hawaiians were the first botanical explorers of the islands. They not only introduced a considerable number and variety of Polynesian economic plants from their migration home in the South Pacific, but also became intimately familiar with the indigenous flora. They possessed or devised specific names for a large number of the indigenous species. Their nomenclature exhibits the rudimentary stages of the binomial system.\* The primitive Hawaiian was an accurate observer, and there are at the present time many evidences of an extensive plant-lore that is almost wholly forgotten by the modern native.

## PERIOD I. THE PERIOD OF DISCOVERY.

### 1. PROBABLE ARRIVAL OF SHIPWRECKED SPANIARDS.

1527. *November.*

The history of the Hawaiian Archipelago, from the standpoint of European exploration and the scientific researches that later accompanied it, begins with the year 1527. The following quotation from a scholarly paper by Professor W. D. Alexander, of Honolulu, entitled "*The Relations Between the Hawaiian Islands and Spanish America in Early Times*," (read before the Hawaiian Historical Society, Jan. 28, 1892, and published by the Society), supplies the detailed statement:

"..... Hernando Cortez, immediately after his conquest of Mexico, fitted out an expedition on the western coast to reinforce his countrymen at the Moluccas. The little squadron, consisting of three small vessels, carrying 110 men, and commanded by

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\* See also J. F. Rock, List of Hawaiian Plant Names, Bur. Agric. & Forest. Bot. Bull. 2, 1913. Honolulu.

Don Alvarado de Saavedra, sailed from Zacatula, Mexico, Oct. 31, 1527. The narrative of the voyage is preserved in Herrera's work, (Herrera, decada 3, libro 1, cap. 6), and also in Burney's "*Discoveries in the South Seas*" (Vol. 1, p. 148).... When the squadron was about a thousand leagues from port it was scattered by a tempest. The two smaller vessels were never heard from again, but Saavedra pursued the voyage alone in the *Florida* to the Moluccas, touching at the Ladrone Islands on his way.

"Now a well-known Hawaiian tradition relates that in the reign of Keliokaloa, son of Umi, a foreign vessel was wrecked at Keei, South Kona, Hawaii. According to the tradition, only the captain and his sister reached the shore in safety. From their kneeling on the beach and remaining a long time in that posture, the place was called Kulou, as it is unto this day. The natives received them kindly and placed food before them. These strangers intermarried with the Hawaiians, and were the progenitors of certain well-known families of chiefs, as for instance, that of Kaikioewa, former Governor of Kauai." Professor Alexander continues, demonstrating the likelihood of these foreigners being the survivors of two lost vessels.

## 2. DISCOVERY BY JUAN GAETANO.

1555.

Quoting further from Professor Alexander's paper, "An official letter from the Spanish Hydrographical Department, dated Madrid, February 21, 1865,.... states that an ancient manuscript chart was found in the archives of that office, in which this group is laid down as in the chart of the Spanish galleon, with the name "Islas de Mesa," and a note declaring that they were discovered and named by Juan Gaetano in 1555. Unfortunately no record of that voyage has been found. ...." There is other evidence to show that the Spanish officials, for commercial reasons, kept the discovery secret.

## 3. DISCOVERY BY CAPTAIN JAMES COOK.

1778. Jan. 18.

The renowned English navigator, Captain James Cook, made three famous voyages of discovery. (1) 1768-1771, to Tahiti, New Zealand, Australia, New Guinea, and the East Indies; (2) 1772-1775, to the South Pacific; (3) 1776-1778, in quest of the long sought "Northwest Passage" between the Pacific and Atlantic. David Nelson was the botanist on Cook's third voyage, and was *the first botanist* in the Hawaiian Archipelago. From the Society Islands he sailed northward, toward the northwest coast of America, and on Jan. 18th, discovered the Island of Oahu, and soon afterwards saw Kauai. On the nineteenth Nii-

hau was sighted. A landing was made at Waimea, Kauai, and trading was carried on with the natives.

*Excursion up Waimea Valley.*

Captain Cook, to quote from his narrative, "made an excursion into the country up the valley, accompanied by Mr. Anderson and Mr. Webber (the surgeon and the artist of the expedition—ed.) A numerous train of natives followed us. . . ." He visited a *heiau*, of which he gives a description and a drawing. No mention is made of the plant life of the region.

*Introduction of the First European  
Live-stock and Vegetables (on Niihau).*

On the twenty ninth he visited Niihau, where water and provisions were taken aboard. Before departure Captain Cook presented the natives with "a ram-goat and two ewes, a boar and sow-pig of the English breed, and the seeds of melons, pumpkins, and onions, being very desirous of benefiting these poor people by furnishing them with some additional articles of food." He further states that "The ground through which I passed was in a state of nature, very stony, and the soil seemed poor.

*First Account of Hawaiian Plant Life.*

It was, however, covered with shrub and plants, some of which perfumed the air with a more delicious fragrancY than I had met at any of the other islands in this ocean." In describing the natives and their mode of life Cook mentions the breadfruit, sweet potato, banana, *kalo* or *taro*, paper mulberry, gourd, *awa* and *kou*.\*

On Feb. 2nd Cook sailed northward and devoted the next months to exploring the coasts of Alaska, Bering Straits, and the Arctic Ocean. Blocked by the ice, he finally decided to return to the Hawaiian Islands for the winter.

On Nov. 26th the Island of Maui was discovered. The natives came out in their canoes, bringing quantities of breadfruit, sweet potatoes, *taro*, bananas, and pigs, which were traded for iron and tools. Cook also procured a quantity of sugar cane. The month of December was spent in beating along the eastern and southern sides of the Island of Hawaii, and on Jan. 17th, 1779, he finally anchored in Kealahakua Bay, on the Kona Coast.

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\* See also: W. A. Bryan, Natural History of Hawaii. Honolulu, 1915.



## 4. EXPEDITION INTO THE KONA FORESTS.

*Attempted Ascent of Mauna Loa  
by John Ledyard and Party.*

Inasmuch as Cook met his death at this place, the official account of the events that transpired here is very full. The only feature of botanical interest was the attempt made by John Ledyard and a party of sailors to ascend Mauna Loa. This is *the first recorded* expedition into the interior of a Hawaiian island.

Ledyard was born in Connecticut and was educated at Dartmouth College for missionary work among the Indians. Upon finding this type of work distasteful, he became a wanderer, ("The American Traveller"). Among many other adventures he visited England, joined the British navy and chanced to obtain a position in Cook's last expedition. Selections from Ledyard's journals and correspondence form the basis for a biography by Jared Sparks, published by Hilliar and Brown, Cambridge, 1828. Ledyard had been stationed on shore at Kealakekua, with a company of marines to protect the tents and astronomical equipment. He "formed the design of ascending the high peak . . . called by the natives Mouna Roa . . ." From his station at the tents, Ledyard sent a note on board the Resolution to Captain Cook, asking permission to make this journey, for the double purpose of exploring the interior, and, if possible, climbing to the top of the mountain. The request was granted. The botanist, David Nelson, and the gunner of the Resolution, were deputed by the commander to accompany him. "Natives were also engaged to carry the baggage, and serve as guides through the woods. . . . On first leaving the town, their route lay through enclosed plantations of sweet potatoes. . . . Now and then a patch of sugar cane was seen. Next came the open plantations, consisting chiefly of breadfruit trees, and the land began to ascend more rapidly."

"We continued up the ascent," he writes, "to the distance of a mile and a half further, and found the land thick covered with wild fern, among which our botanist found a new species. It was now near sunset, and being upon the skirts of these woods, that so remarkably surrounded this island at a uniform distance of four or five miles from the shore, we concluded to halt, especially as there was a hut hard by, that would afford us a better retreat during the night, than what we might expect if we proceeded. When we reached that hut, we found it inhabited by an elderly man, his wife and daughter. . . . They were somewhat discomposed at our appearance and equipment, and would have left their house through fear, had not the Indians (Hawaiians—ed.) who accompanied us, persuaded them. . . . We sat down together before the door, and from the height of the situation we had a complete retrospective view of our route, of the town, of part of the bay, and one of our ships, besides an extensive pros-

pect on the ocean, and a distant view of three of the neighboring islands.

"As we had proposed remaining at this hut through the night, and were willing to preserve what provisions we had ready dressed, we purchased a little pig, and had him dressed by our host, who bestirred himself and soon had it ready. As soon as the sun was set, we found a considerable difference in the state of the air. At night a heavy dew fell, and we felt it very chilly, and had recourse to our blankets, notwithstanding we were in the hut. The next morning we found there had been a heavy rain, though none of it had approached us, notwithstanding we were within two hundred yards of the skirts of the forest. And it seemed to be a matter of fact, both from the information of the natives and our own observations, that neither the rain nor the dews descended lower than where the woods terminated, unless at the equinoxes or more periodical conjuncture, by which means the space between the woods and the shore is rendered warm, and fit for the purposes of culture, and the vegetation of tropical production.

"We traversed these woods by a compass, keeping a direct course for the peak, and was so happy the first day as to find a footpath that tended nearly our due course, by which means we travelled by estimation about fifteen miles, and though it would have been no extraordinary march, had circumstances been different, yet, as we found them, we thought it a very great one; for it was not only excessively miry and rough, but the way was mostly an ascent, and we had been unused to walking, and especially to carry such loads as we had. Our Indian companions were much more fatigued than we were, though they had nothing to carry, and, what displeased us very much, would not carry anything. Our botanical researches delayed us somewhat.

"The sun had not set when we halted, yet meeting with a situation that pleased us, and not being limited as to time, we spent the remaining part of the day as humor dictated, some in botanizing, and those who had fowling-pieces with them in shooting. For my part I could not but think the present appearance of our encampment claimed a part of our attention, and therefore set about some alterations and amendments. It was the trunk of a tree, that had fallen by the side path, and lay with one end transversely over another tree, and had fallen before in an opposite direction, and as it measured twenty-two feet in circumference, and lay four feet from the ground, it afforded very good shelter except at the sides, which defect I supplied by large pieces of bark, and a good quantity of boughs, which rendered it very commodious. We slept through the night under it much better than we had done the preceding, notwithstanding there was a heavy dew, and the air cold.

"The next morning we set out in good spirits, hoping that day to reach the snowy peak; but we had not gone a mile, before the path, that had hitherto so much facilitated our progress, began

not only to take a direction southward of west, but had been so little frequented as to be almost effaced. In this situation we consulted our Indian convoy, but to no purpose. We then advised among ourselves, and at length concluded to proceed by the nearest route without any beaten track, and went in this manner about four miles further, finding the way even more steep and rough, than we had yet experienced, but above all impeded by such impenetrable thickets, as rendered it impossible for us to proceed any further. We therefore abandoned our design, and returning in our own track, reached the retreat we had improved the last night, having been the whole day in walking only about ten miles, and we had been very assiduous too.

"We found the country here, as well as at the seashore, universally overspread with lava, and also saw several subterranean excavations, that had every appearance of past eruption and fire. Our botanist today met with great success, and we had also shot a number of fine birds of the liveliest and most variegated plumage, that any of us ever met with, but we heard no melody among them. Except these we saw no other kind of birds but the screech-owl; neither did we see any kind of quadruped, but we caught several curious insects. The woods here are thick and luxuriant, the largest trees being nearly thirty feet in the girth and these with the shrubbery underneath, and the whole intersected with vines, render it very umbrageous.

"The next day, about two in the afternoon, we cleared the woods by six o'clock, reached the tents, having penetrated about twenty-four miles, and, we supposed, within eleven of the peak. Our Indians were extremely fatigued, though they had no baggage."

Cook was killed in a quarrel with the natives, and Captain King brought the expedition back to England. The collections of David Nelson are now in the Kew Herbarium, that of the Linnaean Society of London, and that of the British Museum.

## 5. VISIT OF PORTLOCK AND DIXON.

1786. May 24th.

After the fateful discovery of the islands by Captain Cook the next vessels to visit the "Sandwich Islands" were the "*King George*" (Captain Nathaniel Portlock) and the "*Queen Charlotte*" (Captain George Dixon). They sailed together from London, to engage in fur trade with the Indians along the northwest coast of America. Cook's third voyage had demonstrated the profitableness of this trade. They arrived at Hawaii May 24, 1786; came to Oahu, Waialae Bay, June 3rd, and later touched at Kauai and Niihau. They returned from the North in November, 1786, and spent the winter, mostly at Waialae, Oahu, and Waimea, Kauai. No scientific or botanical explorations were made; work of this character was not provided for by the expedition.



*Trip up Waimea Valley, Kauai.*

One of Dixon's men made a short trip, occupying part of one day, up Waimea Valley. He describes the *taro* patches, paper-mulberry plantations, and other features of native life and agriculture. In the "Natural History" appendix of Dixon's narrative, there are descriptions and plates of a crab, a snail shell, and a "yellow-tufted bee-eater," but no botanic notes.

## 6. VISIT OF LA PÉROUSE.

1786. *May 28th.*

Four days after the arrival of Portlock and Dixon, and in entire ignorance of their presence, the famous and ill-fated La Pérouse, with his two frigates "*La Boussole*" and "*L' Astrolabe*," sighted the snow-covered peaks of Hawaii. On the 29th his ships stood in the channel between Maui and Hawaii, and considerable trading was done with the natives, who came out in canoes.

*First European Landing on Maui.*

On the 30th he and a large party, in two boats, made a landing at Honua-ula, East Maui. Thus the first landing by Europeans on Maui, (aside from the possibility of unknown Spanish landings), was made by the French. La Pérouse and his party visited several villages in the immediate vicinity. He describes the large gourd calabashes, *kapa* cloth, etc., but gives no detailed or even general statement of the vegetation. He re-embarked at noon, and sailed toward Molokai. Without touching at any of the islands save the one landing on Maui, by June first his ships stood clear to the windward of Oahu and Molokai and continued to the Alaskan Coast.

*Life and Voyage of La Pérouse.*

Although adding nothing to botanical knowledge of the islands, the great voyage of La Pérouse and its mysterious termination, did much to attract scientific attention to the Pacific and its island worlds. Jean-François de Galaup La Pérouse (Comte de), was born Aug. 22, 1741. His youth was spent in various naval expeditions during the war with England.

On Aug. 1, 1785, he sailed, under command of the French Government, in the ships already named, to search for the traditional North-West Passage, vainly attempted by Cook in his last voyage, from the Pacific side. His commands included extensive explorations in the Pacific, as well as to report upon the whale fisheries and the fur trade. His large staff of scientists included a naturalist, a botanical draughtsman, and a botanic gardener.



He arrived at Hawaii, as has been described, his last stop having been at Easter Island, where much exploration was done.

*Necker Island.*

After leaving Hawaii he reached Alaska in June, 1786. After six weeks of exploration he was driven away by stormy weather, and sailing southwest, encountered the leeward islands, and on Nov. 5, 1786, discovered Necker Island. He continued to the Asiatic coast, and most fortunately decided to send Lesseps back to Europe by an overland route. Lesseps left the expedition at Kamchatka, and took with him all the valuable journals, notes, and other scientific data that had been made up to that date.

A part of the "*Astrolabe*" crew was murdered by Samoans, at Mauna, in December, 1787. La Pérouse continued the eventful voyage, and was in Botany Bay, Australia, in January, 1788. After leaving this port nothing more was heard of him or his squadron. Several searching parties and relief expeditions were sent out, without success. In 1826 Captain Peter Dillon found the wreckage of the vessels on Vani-koro, a small island to the north of the New Hebrides. In 1828 Dumont d'Urville visited this island and erected there a monument commemorating La Pérouse and his unfortunate voyage.

(To be continued.)

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

OCTOBER, 1918

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The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

HONOLULU, OCTOBER, 1918.

No. 10

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In the forest planting being undertaken on the slopes of the Waianae Mountains, Oahu, a variety of trees of a xerophilous nature will be tried out in order to determine those which are best suited for this dry region.

The Government Nursery is supplying trees at a generous rate to those who desire them for reforestation purposes.

The Division of Plant Inspection fumigated 2707 bags of rice, corn, corn flour and rolled oats for local merchants during August and thus saved for human consumption a quantity of foodstuffs which otherwise would have been lost.

The supplementary rules of the Territorial Veterinarian for the anthrax-infected area on Kauai, printed in this issue, will enable the local veterinarians to prevent the spread of this disease in the most efficient manner.

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## Division of Forestry

---

Honolulu, Hawaii, Sept. 14, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of August, 1918:

### FOREST FENCING.

The new fence on the boundaries, where needed, of the addition recently made to the Makawao forest reserve, Maui, was completed on August 31, under the direction of Ranger Lindsay, together with repairs to the existing old fence.

A part of the old fence on one side of the right-of-way leading from Lualualei over Kolekole Pass to Waianae-uka, Oahu, was shifted near the trail so as to afford greater area for tree planting.

On August 20 work was begun on the construction of a fence on a part of the boundary of the new Waiahole forest reserve,

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Oahu, where no land exchange is involved, so as to begin the immediate protection of the forest from the further raids of wandering stock. This section of the fence will be approximately 0.64 mile long and goes from the northeast corner of the reserve down to the impassable stream bank in the bottom of the main valley. It is planned to fence the remaining boundary after the proposed land exchange with Mr. McCandless has been settled. Three standard forest reserve monuments were also placed at important corners of the Waiahole reserve.

In response to my conference with Governor McCarthy, which was followed up by my letter to him of August 6, a copy of which was transmitted to you with my July report, action has been taken by the Commissioner of Public Lands to require the building and repairing of the fences described in my letter. Among these is the fence on the boundary of the Makua-Keaau reserve, Oahu, which Mr. McCandless has promised the Governor and Land Commissioner he will build at once.

#### KOKEE CAMPS.

Following the approval of the general plan for granting permits for camps at Kokee, in the Na Pali Kona forest reserve, Kauai, which was given at the Board meeting of August 13, notices were sent to all applicants of the amount of the first payment and of the method of securing a camping permit. To date no replies have been received except from two of the prospective permittees, who have withdrawn their applications, and unofficially I have heard that the applicants are dissatisfied with the high rates charged.

#### FOREST PLANTING.

On August 19 the planting of koa trees was begun in the Lualei forest reserve, Oahu, at the top of Kolekole Pass, where this native tree formerly was found. The frequent showers at this high elevation made conditions quite favorable for tree planting. Progress was also made in starting the germination of seedlings of various species at the Mikilua Nursery for future planting.

On Kauai, Ranger Lovell planted 198 swamp mahogany trees on the Kealia forest reserve.

#### ABSENCE OF FIRES.

Owing to favorable weather conditions no grass or forest fires have been reported or observed this year to date, and it is hoped that the season will be passed through in this fortunate manner.

#### KAHOOLAWE TRIP.

On August 31, at the request of the Governor, I began with him and Land Commissioner Rivenburgh a two-day visit to the

Island of Kahoolawe in order to acquaint them with actual conditions on the island preliminary to issuing a lease for the use of the island under certain restricted conditions.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, Sept. 13, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR:—I herewith submit a report of the work done during the month of August, 1918:

### NURSERY.—DISTRIBUTION OF PLANTS.

	Seed Boxes.	Transplant Boxes.	Pot Grown.	Total.
Sold .....	....	100	79	179
Gratis .....	3000	1700	570	5270
	<hr/> 3000	<hr/> 1800	<hr/> 649	<hr/> 5449

### COLLECTIONS.—GOVERNMENT REALIZATIONS.

Collection on account plants sold.....	\$ 3.00
Rent office building, Nursery Ground, June.....	35.00
	<hr/> \$38.00

### PLANTATION COMPANIES AND OTHER CORPORATIONS.

The distribution of plants under this heading amounted to 49,000 in seed boxes and 62 pot grown, making a total of 49,062 plants.

### MAKIKI STATION.

The work done at this Station has been principally routine, namely, mixing and sterilizing soil, potting and transplanting plants into boxes, etc.

### HONOLULU WATERSHED PLANTING.

We have had the men employed on the watershed cutting and trimming the trees along the road running through the planted



forest, also hoeing and clearing away grass and vines from the young trees in Makiki Valley.

The cutting and trimming of the trees will greatly improve the road and a great deal of the best of the timber can be cut up at Makiki Station and used for fence posts, boxwood, etc. We are gradually getting a large quantity of this wood to Makiki, and we will later have it sawed up and used for different purposes. We are also opening up vistas which will prove attractive for tourists and others when the road is repaired.

#### ADVICE AND ASSISTANCE.

The following number of visits were made and advice given at the request of people in and around Honolulu:

Visits made, 6; advice by telephone, 8; advice by letter, 3; advice to people calling, 10.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## Division of Entomology

Honolulu, Hawaii, Aug. 31, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month of August the insectary handled 25,500 pupae of the melon fly, from which there were bred 1844 females and 1571 males *Opius fletcheri*.

The distribution of parasites was as follows:

	Females.	Males.
OPIUS FLETCHERI.		
Oahu:		
Makiki .....	180	130
Nuuanu .....	450	375
Hawaii:		
Kapoho .....	150	80
Hilo .....	1195	860

#### DIACHASMA TRYONI.

Oahu: Nuuanu .....	275	300
Hawaii: Kamuela .....	110	50

## SPALANGIA CAMERONI.

Maui: Paia ..... 2700

## TETRASTICHUS GIFFARDIANUS.

Oahu: Nuuanu ..... 300

## GALESUS SILVESTRI.

Hawaii: Glenwood ..... 300

## PACHYCREPOIDEUS DUBIUS.

Maui: Paia ..... 900

## PARANAGRUS OSBURNI.

Oahu:

Aiea ..... 2300

Makiki Nursery ..... 18,000

Hawaii:

Hilo ..... 3600

Kapoho ..... 3200

Maui:

Paia ..... 4900

Wailuku ..... 3700

Respectfully submitted,

DAVID FULLAWAY,  
Entomologist.

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## Division of Plant Inspection

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Honolulu, Hawaii, Aug. 31, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu,  
T. H.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of August, 1918, as follows:

During the month there arrived at the port of Honolulu 61 vessels, of which 23 carried vegetable matter, with the following results:

Disposal.	Lots.	Parcels.
Passed as free from pests.....	527	18,825
Burned .....	32	189
Fumigated .....	3	10
Returned .....	0	0
Total inspected .....	562	19,024

Of these shipments, 18,736 packages arrived as freight, 216 packages as mail, and 72 packages as baggage.

#### RICE AND BEAN SHIPMENTS.

During the month 72,389 bags of rice and 2877 bags of beans arrived from Japan and Oriental ports, all of which were free from pests.

#### PESTS INTERCEPTED.

Approximately 2073 pieces of foreign baggage belonging to passengers and immigrants were examined and from which were seized and destroyed, by burning, 15 lots of fruit and 12 lots of vegetables.

Following are the more important interceptions during August:

On August 1, a package of tree seed from Java was fumigated as a precaution.

On August 3, ten cases of Bartlett pears from the mainland were burned, being infested with codling moth.

On August 9, a bag of coconuts from Fanning Island was fumigated as a precaution.

On August 10, a package of Otaheite orange trees in the mail, from Pennsylvania, infested with scale insects, was fumigated and released.

On August 25, a shipment of pineapple plants from Florida in the mail was found to be infested with the Florida pineapple mite (*Stigmaca floridanus*). This mite is a serious pest in itself, besides being responsible for the entrance of dangerous fungus diseases into the tissues of the plants through the punctures which it makes. To avoid the possibility of introducing a new pest, the entire shipment was burned at once.

For the accommodation of local merchants, the following cereals were fumigated during August:

1500 bags rice, 612 bags corn, 241 bags corn flour, and 354 bags rolled oats, making a total of 2707 bags.

#### HILO INSPECTION.

Brother M. Newell reports the arrival of seven steamers, three of which carried vegetable matter, consisting of 132 lots and 2329 parcels. In addition to this, a steamer arrived from Japan

direct, bringing 2281 bags of rice, 596 bags of beans, 6 bags of peas, 5 bags of peanuts and 4 cases of vegetable seeds. All of these were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Will Cooper, Plant Inspector for Maui, reports the arrival of six vessels at the port of Kahului, three of which carried vegetable matter consisting of 11 lots and 144 packages, all of which were found to be free from pests.

#### INTER-ISLAND INSPECTION.

Forty-seven steamers plying between Honolulu and other Island ports were attended and the following shipments were passed as free from pests:

Taro .....	349 bags
Vegetables .....	218 packages
Fruit .....	341 packages
Plants .....	73 packages
Sugar cane transshipped.....	250 bags
<hr/>	
· Total passed .....	1221 packages

Two packages fruit, three packages plants and one hundred bags cane seed were refused shipment on account of infestation and undesirable soil.

Through an oversight on the part of the Inter-Island Steam Navigation Company, 100 bags of cane seed were allowed aboard one of their freight boats without our certificate, and this cane came from Ewa Plantation, which, with Oahu and Honolulu Plantations, is placed in a quarantine area on account of the *Anomala* beetle. We notified the shippers and the consignee (Kohala Plantation) to either return or destroy the shipment. As the shipment had already arrived at the plantation, the manager had the hundred bags burned in the furnace.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.



## Division of Animal Industry.

Honolulu, Hawaii, Sept. 16, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of August, 1918.

### ANTHRAX ON KAUAI.

On the 9th instant the Deputy Territorial Veterinarian, Dr. Golding, reported that he had attended a meeting of the Board of Supervisors at Lihue on the 7th instant. The attached letter, addressed by the President of the Board to the Chairman of the said Board of Supervisors, was read and submitted for action.

Dr. Golding further reported that the Board's recommendations were adopted unanimously, but with the proviso that this Board take entire charge of the anthrax control work on Kauai and especially issue such rules and regulations that would insure against the further spread of the disease after the removal of the guards. Also that in order to allow time for the promulgation and publication of such rules the guards would be continued to the end of the fiscal month, that is, August 25th, while Dr. Golding's salary would begin with August 1st.

Besides this information, which was accepted as an official reply in lieu of any direct communication from the Board of Supervisors, Dr. Golding submitted a large number of practical as well as hypothetical contingencies which he desired covered by unequivocal regulations, without which he foresaw difficulties requiring endless referring to this office for adjustment.

In attempting this problem it soon became evident that in order to be effective and at the same time just to all, such rules and regulations could not be made in Honolulu, but would have to be constructed where all the conflicting interests could be consulted at short notice and where the conditions to be dealt with were at hand.

I therefore asked and obtained permission from this Board to again visit Kauai. Under authority of Section 2 of Rule X of the Division of Animal Industry, pertaining to anthrax on Kauai, and approved by the Governor on April 20, 1917, it was decided that the new regulations would need no further approval by this Board or by the Governor, but would become effective upon their publication over the signature of the Territorial Veterinarian. The said section reads:

"Sec. 2. That the Territorial Veterinarian shall proclaim special quarantine on such sections of the Island of Kauai where these diseases are prevalent. Such special quarantine to be en-

forced in accordance with the direction of the Territorial Veterinarian."

I left for Kauai on the 15th and was met by Dr. Golding at Lihue the next morning. The same day a conference was held with Supervisor Menefoglio, in whose district the anthrax infected area is located, and to whose active interest the final satisfactory arrangement is largely due. The whole situation was gone over thoroughly and a tentative set of rules prepared. These were discussed with the vice-president of the Princeville Plantation Company and with the chairman of the Board of Supervisors, and finally the ranch was visited. The conclusion had been arrived at that the unfenced lands of Kalihi-kai and Kalihi-wai should be released from quarantine. Only two cases of anthrax had occurred there, and these were undoubtedly due to infection carried by surface water from the upper pastures when the outbreak was at its highest, more than a year past. Nor could any necessity be seen for restrictions on travel along the main road from Kalihi-wai to Hanalei bridge, though the desirability of keeping this road as free from estrays as circumstances would permit of, was recognized.

The main preventive measure, however, was conceded to be the absolute exclusion of non-vaccinated, susceptible animals from the heavily-infected pastures and premises, and to this end provision must be made to insure that all the enclosing fences be kept absolutely stock-proof, that the gates be kept closed, and that fences and pastures be regularly ridden.

The removal of vaccinated healthy stock from the quarantined area, as well as the butchering of cattle for the local market, must, as hitherto, continue under the direct supervision of the representative of this Board, who will also see to the vaccination of the increase in the breeding paddocks as well as of outside animals that it may be necessary to bring into the quarantined district and its immediate neighborhood. It was further deemed advisable to prohibit the removal of grass seed, grass roots and turf from the infected paddocks, as no method of rendering such material innocuous without destroying its viability is known.

Under date of August 20, the following rules were published in The Garden Island:

#### **BY AUTHORITY.**

**TERRITORY OF HAWAII.—BOARD OF AGRICULTURE AND FORESTRY.**

**OFFICE OF TERRITORIAL VETERINARIAN.**

**IN RE THE REMOVAL OF THE QUARANTINE GUARDS AT KALIHI-WAI AND HANAIEI BRIDGE AND RESTRICTING THE ENTRANCE OF LIVE STOCK INTO THE QUARANTINED AREA.**

Section I. Rule X of the Division of Animal Industry pertaining to Anthrax on the Island of Kauai, with subsequent amendments, remains in force.

Section II. The removal of the quarantine guards from Kalihi-wai and Hanalei Bridge does not constitute a removal of the quarantine of the infected district, except as hereinafter specified.

Section III. All fenced and anthrax-infested pastures, enclosures or premises remain quarantined in so far as the admission to them of unvaccinated animals is concerned, and such pastures, enclosures or premises must be kept so fenced as to prevent absolutely entrance of stray livestock from adjoining highways and districts.

Section IV. All gates opening on public roads or non-infected premises shall be securely fastened and be provided with a sign forbidding the admission of unvaccinated live stock to anthrax-infected districts, and stating the penalty for the violation of the rules and regulations governing the same.

Section V. The Kalihi-kai and Kalihi-wai districts, and the public highway leading from the latter to Hanalei bridge, shall be considered free from anthrax infection and no longer quarantined after the date these regulations become effective; but the local representative of this Board shall reestablish such quarantine, in full or in part, whenever in his opinion it becomes advisable.

Section VI. The removal of the vaccinated live stock in the quarantined district shall be in direct charge of the local representative of this Board, who shall in each case decide upon and superintend the application of such precautionary measures as he may deem requisite to prevent the spread of infection.

Section VII. It shall be the duty of any person to report without delay to the local representative of this Board the sickness or death of any animal in or near the infected district, as well as the presence of any unvaccinated live stock in the quarantined area.

Section VIII. It shall be unlawful for anyone, directly or indirectly, to transfer or carry from any pasture, enclosure or premises, where an animal has died from anthrax, or where deaths of animals have occurred which might be attributed to anthrax, any soil, sod, earth, grasses, grass seed, grass roots or any other substance which might possibly carry the infection of anthrax.

Section IX. These rules shall go into effect on August 26th, 1918.

By direction of the Board of Agriculture and Forestry:

VICTOR A. NORGAARD,  
Territorial Veterinarian.

Any violation of these rules is punishable by a fine not to exceed \$500. (Section 529, R. L. H. 1915.)

In order to carry out these regulations it became necessary to have a sign painted for each gate—a total of sixteen. These signs read as follows:

ANTHRAX. KAPU. KEEP THIS GATE CLOSED. Any person found trespassing on these anthrax-infected premises or admitting to them unvaccinated live stock will be prosecuted to the full extent of the law. Penalty not to exceed \$500.00.

By order of the Board of Agriculture and Forestry.

Before dismissing the guards, Dr. Golding inspected all the fences and took steps to have the defective places repaired. He also attended to the placing of the signs and has secured the services of a mounted patrol man. The few estrays that have wandered in on the road have been returned to their owners with instructions to keep them secured. Dr. Golding feels confident that the new arrangement will prove effective and much more satisfactory to all concerned.

In conclusion I would suggest that the new rules be officially approved by the Board in session.

The revised rules and regulations pertaining to the importation of live stock, a copy of which is attached, have been distributed to the local steamship and navigation companies with the appended circular letter.

#### BOVINE TUBERCULOSIS CONTROL.

The report of the Assistant Territorial Veterinarian again shows a very high percentage of reacting cows in the dairies of Mr. Isenberg and Mr. Bellina. These herds will now be tested every three months until the disease is stamped out.

Respectfully submitted,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.

#### NOTIFICATION TO SHIPPERS, ETC.

Honolulu, Hawaii, Sept. 11, 1918.

To the Agents of Steamship and Navigation Companies, Honolulu, T. H.

GENTLEMEN:—Enclosed please find copy of "Regulations Governing the Importation of Live Stock and Other Animals into the Territory of Hawaii," which became effective on June 8, 1918, and were published in the June number of the Hawaiian Forester and Agriculturist.

You are respectfully requested to familiarize yourself with these regulations and to take the necessary steps to insure that the officers and employees of any vessel carrying live stock or other animals to this Territory, and for which you are responsible as agents, factors or managers, are familiarized with these regulations and instructed to comply with them.

Your attention is especially called to Sec. 1 of Rule III, pertaining to the notification of the Territorial Veterinarian of the presence of live stock on board incoming vessels, their retention, on board or on the pier, until arrival of the inspecting officer, and to the list of the same to be furnished him. This list should be made out and signed by the responsible officer—purser or freight clerk—whether there are animals on board or not—and should be taken to the freight office on the pier where the ship docks, and where the inspecting officer will call for it.

Attention is also called to Sec. 4 of Rule VIII, which makes Honolulu the only port through which dogs may enter the Territory.

To avoid mistakes and insure compliance with these regulations it is suggested that you request your representatives on the



Pacific Coast and elsewhere that they accept for shipment to this Territory no live stock mentioned in Rules IV-VII inclusive, until the consignor has obtained from the local representative of the U. S. Bureau of Animal Industry the required certificates of health.

If you will notify me of the number of copies of these regulations you will require, the same will be forwarded to you without delay.

Very truly yours,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, Sept. 13, 1918.

Doctor Victor A. Nörgaard, Chief, Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu.

DEAR SIR:—I beg to submit the following report for the month of August, 1918:

### TUBERCULOSIS CONTROL.

The following dairy cattle were tuberculin tested during the month:

	Tested.	Passed.	Condem'd
C. W. Lucas .....	3	2	1
C. H. Bellina .....	131	122	9
C. H. Bellina .....	59	54	5
Waialae Dairy .....	431	394	37

The above tabulated list gives a total of 624 head tested, of which 572 were passed and 52 condemned and branded.

Besides the above, post-mortem examinations were made at the various abattoirs on 56 condemned cattle, all of which presented lesions of tuberculosis.

### IMPORTATIONS OF LIVESTOCK.

S. S. Lurline, San Francisco: 2 dogs, W. F. X. Co.; 2 crates rabbits; 2 dogs, John Kelly; 1 crate poultry, D. C. Lindsay, Kahului.

S. S. Sachem, San Francisco: 1 dog, W. F. X. Co.

S. S. Hyades, San Francisco: 5 crates poultry, F. C. Ather-ton; 2 crates poultry, 7 crates pigs, Hawaii Meat Co.; 8 cows, C. W. Lucas; 1 bull.

Respectfully submitted,

LEONARD N. CASE,  
Asst. Territorial Veterinarian.

# History of Botanical Exploration in Hawaii

(Continued.)

## PERIOD II. THE EARLY PERIOD.

### 7. BEGINNING OF THE SANDALWOOD TRADE.

1791. *October.*

The beginning of the sandalwood trade marked the opening of a new epoch in Hawaiian history, and had a distinct influence upon the movement of shipping and of visitors from abroad, toward the islands. Captain Kendrick, in the sloop "*Lady Washington*," left three sailors—Coleman, Williams and Rowbottom—on the Island of Niihau. They were instructed to collect quantities of sandalwood and pearls, and to have them in readiness upon Kendrick's return from New England. For a period of many years following this small beginning, the sandalwood tree was the *motif* in the outside world's relations with Hawaii; just as at a subsequent period the whale was dominant; and during the present epoch, the sugar cane.

### 8. THE COMING OF MARIN.

1791.

This year was signalized by the quiet arrival of a Spaniard, Don Francisco de Paula Marin, from Andalusia. He remained in Hawaii until his death in 1837, and exerted a marked influence upon the local horticulture and agriculture. He was a practical gardener of no small degree of skill and enthusiasm, and introduced, cultivated, and distributed many useful plants. He was known to the Hawaiians as "*Manini*," and his gardens in Pauoa Valley, near Honolulu, were famous for their fruits, flowers, and vegetables. To this day a number of varieties of fig, grape, pineapple, citrus fruits, etc., are called "*Manini*" by the Hawaiian natives.

### 9. THE THREE VISITS OF VANCOUVER.

The next event of note from the botanical standpoint was the coming of the sagacious and kindly English seaman, Vancouver. His repeated visits made possible a series of explorations of greater thoroughness and scientific value than any which preceded them. It has been truly stated that "The three visits of Vancouver form an era in the history of these islands, and his name is justly cherished as that of a wise and generous benefactor to the Hawaiian people.

"Captain George Vancouver was sent by the British Govern-

ment to receive the cession of Nootka Sound and the adjoining country from a commissioner of Spain; and to make a complete survey of the northwest coast. He had under his orders the ship 'Discovery' and the armed tender 'Chatham'.—Alexander.

*First Visit Mar. 2 to 16, 1792.*

*Presents of Useful Plants.*

They sailed north from Tahiti, and on March 2nd arrived at the Kōna side of Hawaii. Trading was begun, and Vancouver mentions the "very excellent water-melons." No landing was made, but Kaiana visited Vancouver, who presented him with "some vine and orange plants, some almonds, and an assortment of garden seeds, to all of which he promised the most particular care and attention." Vancouver later states: "It was a great pleasure to observe the avidity with which all the chiefs who had visited the ship sought after the vegetable productions we had brought; which, if attended to, will in future add to their present abundant production." At Kawaihae Bay he gave presents of "some fine orange plants and a packet of different garden seeds; and likewise a goat and kid."

*Oahu.*

Sailing on toward Oahu, he remarks the "apparent sterility" and "few scattered miserable habitations" on Lanai. Anchoring at Waikiki Bay, trading was resumed, and excellent musk and water-melons were received. The plain and valleys around Waikiki were observed to be in "a high state of cultivation and fertility." Vancouver and a party (including Menzies, the botanist), landed, in quest of water for the ships, and went a mile inland. He describes the numerous *taro* patches, and contrasts the laborious cultivation observed here with the spontaneous crops of Tahiti. Fresh water not being readily obtainable at Waikiki, he set sail for Kauai, and arrived at Waimea on March 9th.

*Kauai and Niihau.*

A landing was made, temporary quarters established, and with several men, including Menzies, Vancouver made a short trip across the Waimea lowlands. He remarks the extensive *taro* lands, and plantings of sugar-cane and sweet potatoes. Several other short excursions were made, none occupying more than part of a day. Among other presents, a pair of goats were given. On the 14th Vancouver sailed for Niihau, where a plentiful supply of yams and other provisions were obtained; he gave many useful articles of Captain Kendrick's sandalwood collectors, including garden seeds, orange and lemon trees; and on the sixteenth sailed for America.

Prominence has been given to the first introduction of Euro-

pean live-stock and plants, because of the profound effect of these alien agencies upon the indigenous vegetation. The wild goats and cattle multiplied with almost incredible rapidity, and before many years had passed, they had done irreparable damage to the Hawaiian forests. The pronounced depletion of the forests in all regions to which these herbivorous pests had access, the extinction of numerous plant species, and the conspicuous curtailment of the ranges of many others may all be traced to the destructive influences of wild goats and cattle running at large through the mountains and waste lands.

Similarly, thousands of acres formerly occupied by the native vegetation is now in the possession of ruderals—weeds cosmopolitan throughout the tropics having displaced the less vigorous indigenous forms. There is probably no region that manifests with greater clearness than Hawaii the rapid action and far-reaching influences of alien organisms upon an insular fauna and flora. The innumerable introductions—both intentional and unintentional—of plants and animals from many other regions has entirely changed the phyto-geography of all Hawaii save the comparatively inaccessible mountain fastnesses.

*Second Visit of Vancouver—*

*Feb. 14 to March 30, 1793.*

*Botanical Excursion at Kawaihae.*

*First Cattle Introduced.*

Vancouver returned to Hawaii from the California coast, and anchored at Kawaihae Bay, Feb. 14, 1793. A landing was made; and four sheep presented to "Kahowmotoo (Keeaumoku), who had taken the greatest care of the goats I had presented him with on a former occasion." Menzies made a botanical excursion of several hours, "in pursuit of new vegetable productions. He returned in the evening, after receiving much hospitable civility from the natives." On the 19th a bull was landed (the first cattle introduced into the Hawaiian Islands. A cow was also sent, but died during passage from the ship to the land.

Upon removing to Kealahou, where Kamehameha visited the ships, the remaining live stock, five cows and three sheep were landed. Vancouver remained at this harbor until March 7th, and established a shore station for astronomical observations. Menzies took advantage of this opportunity and made a four-day trip into Kona, attended by a midshipman and nine natives.

*Excursion to the West Maui Mountains.*

On March 12th Vancouver anchored off Lahaina, Maui; on the 14th Menzies and a party of sailors and natives made a trip into the mountains back of Lahaina, returning on the evening of the following day. Vancouver describes the cultivated portions of the Lahaina plain, mentioning the bread-fruit groves, and the



ravaged aspect of the country due to the native warfare. Some goats were presented, "these being the first foreign animals imported into Maui."

*Outrigger Canoe of "Northwest" Pine.*

After visiting Oahu Vancouver proceeded to Kauai; en route he passed a number of canoes, one of which "proved to be without exception the finest canoe we had seen amongst these islands. This vessel was sixty-one feet and a half long . . . made out of an exceedingly fine pine-log [*Pseudotsuga*]." The natives told him that the log had drifted ashore on Kauai, "in a perfectly sound state." He further states that "the circumstance of fir timber being drifted on the northern sides of these islands is by no means uncommon," especially on Kauai.

*Third Visit of Vancouver,  
Jan. 9 to March 15, 1794.*

Vancouver left the Islands on March 30th, and sailed to the American coast; returning on January 9, 1794, he anchored in Hilo Bay. More cattle and sheep were landed, and a *tabu* for ten years was laid upon them. Vancouver then sailed to Kealahou, where the ships remained six weeks.

*Excursion to Hualalai.*

On the 16th of January Menzies and a party started "on an excursion into the interior part of the country. . . . The party accompanying Mr. Menzies returned with him on Saturday, the 25th, after having had a very pleasant excursion; though it had been somewhat fatiguing in consequence of the badness of the paths in the interior country, where in many places the ground broke in under their feet. Their object had been to gain the summit of Mowna Roa, which they had not been able to effect . . . but they had reached the top of another mountain. . . . called by the natives Worraray [*Hualalai*] . . . on its summit was a volcanic crater" . . . . An excellent plate of this crater appears in Vancouver's "Voyage of Discovery."

*Menzies' Narrative of the Hualalai Expedition.*

In Thrum's Hawaiian Annual for 1910 is reproduced an extensive "Extract from A. Menzies' Journal of Vancouver's Voyage, 1790-1794; British Museum, MSS. Department." This is said to be the first time this account appears in print. The narrative of this, the *second fully recorded scientific trip* made by Europeans in Hawaii, contains much of interest, as the following quotations will demonstrate:

"Being very desirous of examining the mountains and interior

parts of the islands for plants and other natural productions, and particularly for making a good collection of seeds to send home for His Majesty's Gardens," etc.

The party, including many native hangers-on, left Kailua on the morning of January 17th; and ascended to the upper limit of the villages and native plantings, where the night was spent in "a few scattered huts." The evening of the second day found them well up in the forest zone, near the upper edge of the woods. Camp was made here, and a messenger sent back to Kealakekua, to carry tidings of the trip and to fetch "some little things we wanted."

An early start was made the morning of the third day, nineteenth, and at half past eight the summit was reached. As the weather was clear the party had a magnificent view of the surrounding country. Menzies describes the scene, summit, and craters and continues:

"In my rambles I collected every plant I met with, either in flower or seed, which I was sorry to find did not amount to a very numerous catalogue, on account of the dormant state of vegetation in these upper regions at this season of the year, but from the variety I saw of small plants and low shrubs, in appearance quite new to me, I consider this peak as a very interesting tract for a botanist to explore in the summer months when, I have no doubt, every steep and cleft will be adorned with flowers innumerable.

"Amongst the plants in flower at this time was the *Sophora tetraptera*, which did not exceed the size of a small shrub though lower down the mountains, and particularly on some of the other islands it grows to a pretty large tree; from the wood of which, the natives informed me, they made their spears, and from the fine polish it bears it almost equals in hardness and density of grain the most beautiful mahogany.

"The *Dodonea viscosa* grew here very plentifully and seemed to thrive equally well as down at the seaside, where it is not uncommon. I also found here a small shrubby geranium, quite a new species, and I believe the only one of that genus which has hitherto been found in any of the islands of the Pacific Ocean." (*Geranium cuneatum*, Hooker.)

The remainder of the day, and the next (fourth) day, were spent on the summit "traversing the peak in various directions"; on the morning of the fifth day the descent was begun. The route chosen lay toward the hollow between Hualalai and Mauna Loa; the party was much fatigued by the rough lava, and at night camped in a valley between the two mountains.

The next morning (sixth day) Menzies resolved to also ascend Mauna Loa, and the day was expended in a futile attempt, amid the protests of the natives. Nightfall found the weary party back in their valley cave again. On the seventh day the homeward descent was continued, and by evening time the party was within nine or ten miles of Kealakekua. They "came to a village among

the upper plantations where we took up our residence for the night." The next day was spent in leisurely travel; they stayed overnight at a village close to Kealakekua, and on the ninth day returned aboard the "Discovery."

### *Excursion to Mauna Loa.*

During the long stay at Kealakekua Menzies and a large party made "another excursion into the country for the purpose of ascending Mowna Roa;" this trip occupied a number of days.

After concluding with Kamehameha the political business of the voyage (see Alexander), Vancouver sailed to Kauai and Niihau, and left the Islands, after discovering Bird Island (Nihoa), on March fifteenth.

### *Summary of Vancouver's Life*

George Vancouver was born 1758; entered the English navy at the age of thirteen; and accompanied Captain Cook on Cook's second and third voyages of discovery. In April, 1791, Vancouver began his great expedition to the northwest coast of America. He visited Australia, New Zealand, Tahiti and Hawaii. The Hawaiian visits have been described. After the third exploration of the northwest coast he returned to England, October, 1794, and reached the Thames Oct. 20, 1795. He immediately set about the publication of his narrative, but died May 10, 1798. His brother John, assisted by Captain Puget, completed and published the "Voyage of Discovery" in 1798.

### *Menzies' Botanical Work.*

The collections made by Menzies were deposited in the herbarium of the British Museum and in the Kew Herbarium; some, by exchange, at the New York Botanical Garden. His name is perpetuated in the scientific names of a number of Hawaiian plants—*Abutilon Menziesii*; *Asplenium Menziesii*; *Astelia Menziesiana*; *Bonamia Menziesii*; *Breweria Menziesii*; *Cibotium Menziesii*; *Coprosma Menziesii*; *Coreopsis Menziesii*; *Cyrtandra Menziesii*; *Kadua Menziesiana*; *Lycopodium Menziesii*; *Pandanus Menziesii*; *Raillardia Menziesii*; *Scaevola Menziesiana*; *Schiedea Menziesii*; *Selaginella Menziesii*; *Sida Menziesiana*.

## 10. THE TWO VISITS OF CAPTAIN BROUGHTON.

*Arrival at Kealakekua Jan. 8, 1796.*

*More Domesticated Plants and Animals.*

The British sloop "Providence," commanded by Captain William Robert Broughton, followed Vancouver in the Pacific. Broughton's route of exploration which included the Asiatic

coast, brought him twice to Hawaii. In his narrative of the visit to Kealakekua he writes: "The cattle left here by Vancouver had bred and were in excellent order; it is probable that they will stock the island, as a *taboo* is placed upon them for ten years. The goats multiply prodigiously; I added a male and female to their number, leaving them under the care of Young, with a breed of geese and ducks; the first lieutenant also spared them his pigeons. Some grapevines from Port Jackson and vegetable seeds were planted and sown during our stay. Pumpkins and melons were in no great plenty, though we had excellent cabbages weighing near two pounds."

#### *Native Agriculture at Lahaina.*

At Lahaina Broughton writes: "Our excursions on shore were frequent and the natives civil. The cultivation was excellent; and the extent of ground made use of for that purpose reminded us of the scenery of our native country. There were the various productions of taro, sweet potatoes, melons, sugar-cane, gourds, and pumpkins, amidst groves of the breadfruit trees and cocoanuts, which universally afforded us shady walking."

#### *Departure and Return. Second Visit. July 6-13, 1796.*

The "Providence" departed from Niihau for Nootka Sound February 22nd; the following July, returning from Monterey Bay, she touched at Kealakekua for water and provisions. "The garden seeds had failed through inattention; some roots of horseradish were in high vegetation, and the cabbages were reported to us as flourishing considerably in the interior." Broughton sailed northwestward, touching Oahu, Kauai and Niihau, and left Niihau on July 31st.

The botanist of Broughton's voyage was Alexander Bishop, but Broughton's narrative contains no specific statement of botanical investigations in Hawaii.

### 11. FIRST DISTILLERIES.

*About 1800.*

"The art of distilling was introduced by some Botany Bay convicts before the year 1800. It is said to have been first practised here by a William Stevenson, from New South Wales. The root of the *Ki* plant (*Cordyline terminalis*) was first baked for days in the ground, after which it became very sweet. It was then macerated in a canoe with water to ferment, and in five or six days was ready for distillation. The rude still was made of iron pots, procured from ships, with a gun-barrel used as a tube to conduct the vapor. The liquor obtained in this way, *okolehao*, was nearly pure alcohol. At one time almost every chief had his still."—Alexander.



## 12. MAXIMUM OF SANDALWOOD TRADE.

1810-1825.

"The sandalwood trade with China reached its height. While it lasted, this wood was a mine of wealth to the kings and chiefs, by means of which they were enabled to buy guns and ammunition, liquors, boats, and schooners, as well as silks and other Chinese goods, for which they paid exorbitant prices.... This trade greatly increased the oppression of the common people, multitudes of whom were obliged to remain for months at a time in the mountains searching for the trees; felling them, and bringing them down on their backs to the royal store houses."—Alexander.

*References.*

Two excellent accounts of the Sandalwood Epoch occur in Thrum's Hawaiian Annual for 1905 and 1915, one by Thrum, the other by Lydgate.

## 13. VISIT OF KOTZEBUE AND CHAMISSE.

1816, Nov. 24.

This date marks the arrival of Captain Kotzebue at Kawaihae Bay in the Russian discovery-ship "Rurick." The naturalists who accompanied this expedition were Chamisso and Worms Kiold. Chamisso may be classed as one of the great pioneer botanists of Hawaii. A number of plants have been named in his honor: *Viola Chamissoniana*, Givgins; *Tetramolopium Chamissonis*, Gray; *Scaevola Chamissoniana*, Gaud.; *Cibotium Chamissoi*, Kaulf. In company with von Schlechtendahl (Diedrich Franz Leonhard), Chamisso described in "*Linnæa*" a number of Hawaiian plants. The life of Chamisso is of much interest, for he was an army officer, and a man of letters, as well as a botanist. The following brief epitome will indicate the main events of his life.

*Life of Chamisso.*

Born at Chateau of Boncourt, France, Jan. 30, 1838. His family driven from France by the Revolution and settled in Berlin. Young Chamisso entered the Prussian army; he studied, wrote poetry, became lieutenant in 1801, and obtained release from the army in 1807. His parents dead, he was "homeless, without a profession, disillusioned and despondent." He lived in Berlin until 1810, at which time he received teaching post in French high school. Chamisso studied botany in Switzerland, and returned to Berlin in 1812, where in 1813 he wrote his most famous book "*Peter Schlemihl*," the man who sold his shadow.

In 1815 Chamisso was appointed botanist to the Russian exploring expedition round the world, commanded by Otto von Kotzebue, in the "*Rurik*." His Hawaiian and other botanical results were published in "*Linnaea*." He returned to Europe in 1818, and was made custodian of Berlin botanical gardens. He married in 1820, and devoted the remainder of his life to poetry and literature.

*Kotzebue's Trip to Pearl Harbor.*

Kotzebue conferred with Kamehameha and then sailed to Honolulu. Here he remained for two weeks. During this interval, to quote from Kotzebue's narrative he "resolved to undertake a short excursion on foot to the stream, called by the English Pearl River, which lies about half a day's journey to the west of Hanarura (Honolulu). The pearl fishery is here forbidden, on pain of death; only the king takes advantage of it. Some pearls, out of this river, which Kareimoku gave me, were very beautiful. In the meantime, Mr. Chamisso made an excursion to the interior."

Kotzebue's party, consisting of himself, Dr. Eschscholz, the second mate, and two natives, started early on the morning of Dec. 8th. "The road... lay toward the west, through a beautifully cultivated valley (Nuuanu), bordered in the north by a romantic wilderness, formed by wood-crowned heights; and on the south by the sea. The luxuriant taro fields.... attracted my attention. ....In the spaces between the fields, which are between three and six feet broad, are pleasant shady walks, planted on both sides with sugar cane or bananas...."

"Sugar plantations, taro fields, and far-scattered plantation succeeded each other on our road, and we had inadvertently travelled five miles to the great village Mauna Roa (Moanalua), situated in a pleasant valley, on the declivity of a hill. A boisterous rivulet, of the same name, falls here into the sea. Before the village, consisting of small, neat thatched houses, lay two groves of cocoa (palm) and breadfruit trees, through which we passed, in order to rest on a hill on the other side.... Opposite the village is a convenient harbor, which, however, has a dangerous entrance, between reefs (Kalihi)."

"After we had rested sufficiently, we continued our journey, left the shore, and crossed a promontory, extending far into the sea, where the road led us over a high mountain.... We noticed here several tapa-plantations, a tree from whose bark the natives make their cloth.... Our road led us, after two hours' walk, into a charming valley, where we sat down under the shade of breadfruit trees, on the bank of a salt-lake (Salt Lake Crater), whose owner.... derives a considerable revenue from the bank of this lake being covered with the most beautiful salt."....

"After having refreshed ourselves a little, we passed over a high hill, and soon came into a beautifully cultivated plain (Halawa and Aiea).... The country is here indescribably beautiful;

fields and villages are intermixed with cocoa (palm) and bread-fruit plantations.... At five o'clock we reached the place where we intended to stay that night, six miles straight from Hanarara. It was a pretty village.... which took its name, Waujau (Waiau), from a quick running rivulet that here falls into the sea. I directed my attendants to procure me a boat to go the next morning to Pearl River, from which we were not far off; but their endeavors were in vain, the inhabitants having left the coast for some days, on a fishing expedition."....

The natives gave Kotzebue and his party a good supper of roast pig, *taro*, sweet potatoes and fresh fish and "prepared clean mats for our beds; but the liveliness of the gnats, which danced merrily over our faces, deprived us of sleep; and the next morning, being unable to get a boat, we were obliged to return without having seen Pearl River.... In the evening we safely arrived on board."

The collections of Chamisso are in the herbarium of the Royal Botanical Gardens, Berlin.

### PERIOD III. THE MIDDLE PERIOD.

#### 14. VISIT OF FREYCINET.

*Aug. 8, 1819. Kailua.*

The next event of botanical and scientific interest in Hawaii was a visit by the distinguished French circumnavigator, Freycinet. Louis Claude Desaulses de Freycinet was born in Montelimart, Aug. 7, 1779. He entered the French Navy in 1792. In 1800 he and his brother joined the expedition sent out under Captain Bandin in the "*Naturaliste*" and "*Geographe*" to explore the south and southwest coasts of Australia. In 1805 he returned to Paris, and was entrusted by the government with the work of preparing the maps and plans of the expedition. He also completed the narrative, and the entire work appeared under the title "*Voyage de découvertes aux terres australes*," Paris, 1807-1816.

In 1817 Freycinet commanded the "*Uranie*" in which Arago and others went to Rio de Janeiro, to take a series of pendulum measurements. This was part of a comprehensive plan for collecting scientific data along many lines. For three years Freycinet cruised about, visiting Australia, Marianne, Hawaiian and other Pacific Islands, South America, and other places. Notwithstanding the loss of the "*Uranie*" in the Falkland Islands during the homeward voyage, he returned to France with excellent collections in all branches of natural history, and with voluminous notes and drawings.

The results of this great voyage of exploration and research were published under the direct supervision of Freycinet in 1824-44. The title was "*Voyage autour du monde sur les corvettes Uranie et la Physicienne*," in thirteen quarto volumes and four



folio volumes of fine plates and maps. In 1825 Freycinet was made a member of the Academy of Sciences, and later became one of the founders of the Paris Geographical Society. He died at his estate, Freycinet, on Aug. 18, 1882.

### *Visit to Hawaii.*

In Hawaii Freycinet visited Kailua on August 8th, sailed across the channel to Lahaina, Maui, on the 15th, and remained there until the 26th. At this station a series of pendulum observations were made. He then proceeded to Honolulu, and sailed for Port Jackson on August 30th. His stay in the islands was less than three weeks.

### *Gaudichaud.*

The botanist of Freycinet's expedition was Charles Gaudichaud-Beaupré, generally known as Gaudichaud. He was born at Angoulême, France, Sept. 4, 1789, and died at Paris, Jan. 16, 1854. He studied botany and pharmacy at Cognac and Paris. In 1810 he was appointed as dispenser in the military marine, and from 1811 to 1814 served at Antwerp. In 1817 he joined the corvette "*Uranie*" as pharmaceutical botanist to the circumpolar expedition commanded by De Freycinet. The wreck of the vessel on the Falkland Islands, at the close of 1819, deprived him of more than half the botanical collections he had made in various parts of the world. In 1830-33 he visited Chile, Peru, and Brazil. In 1836-37 Gaudichaud was botanist of "*La Bonite*" during its circumnavigation of the globe, and returned to Hawaii, but the only record of his collections consists of a few plates, with no adequate notes. Besides accounts of his voyages, Gaudichaud wrote various treatises upon plant morphology and organography. His Hawaiian botanical material was published in the "*Botanique du Voyage de l'Uranie*."

A number of Hawaiian plants have been named in his honor; for example—*Cassia Gaudichaudii*, Hook. & Arn.; *Cheirodendron Gaudichaudii*, Seem.; *Lobelia Gaudichaudii*, DC.; *Clermontia Gaudichaudii*, Hillebr.; *Scaevola Gaudichaudii*, Hook. & Arn.; *Exocarpus Gaudichaudii*, A. DC.; *Pritchardia Gaudichaudii*, H. Wendl.; *Gahnia Gaudichaudii*, Steud.

Several Hawaiian plants have been named in honor of Freycinet, for example—*Santalum Freycinetianum*, Gray, and *Freycinetia Arnotti*, Gaud.

The botanical labors of Gaudichaud, both in Hawaii and elsewhere, were substantial and noteworthy in character, and added greatly to the taxonomic knowledge of his times.

## 15. THE PIONEER AMERICAN MISSIONARIES.

March 31, 1820. *Kohala*.

The next landmark in the scientific history of Hawaii was the coming of the first American (Protestant) missionaries. They



established mission stations at Honolulu, Kailua, and other island ports. For a complete account see Dibble, "*History of the Sandwich Islands*," or Alexander.

In April, 1822, a deputation of English missionaries, headed by Rev. William Ellis, arrived in Honolulu, and remained four months, after most cordial reception from both the native chiefs and the American missionaries.

#### 16. TOUR OF THE ISLAND OF HAWAII BY ELLIS.

1823. *July-Sept.*

In April, 1823, a reinforcement to the mission arrived from America and plans were made to extend the work. Ellis, accompanied by Messrs. Thurston, Bishop and Goodrich, undertook a tour of the Island of Hawaii, to "select the most eligible places for missionary stations. These, though the principal, were not the only objects that occupied our attention during the tour. We availed ourselves of the opportunities it afforded, to make observations on the structure of the island, its geographical character, natural scenery, productions, and objects of curiosity."

#### *Summary of Botanic Observations.*

Ellis' very interesting "*Narrative of a Tour Through Hawaii*" was published in London, 1825, and consists of fifteen chapters packed full of accurate and engaging information. The following list of topics (fourth edition used for pagination) will serve to indicate the character of Ellis' observations with special reference to botany—native plantations around Kailua (46); ascent of Hualalai (54); native agriculture at Lahaina, Maui (61); copious account of *wauke* (paper mulberry) plant, and the making of *Kapa* (bark cloth) (93-98); method of cooking *taro*, (204-5); *wili-wili* tree, (212); the *ohelo berry*, (223-4); the *ti* plant, (255-7); Sandalwood, (300-1); construction of the Hawaiian house, (313-20); vegetation around Hilo, (336-7); native canoes, (341-3); the calabash gourd, (376-7); the *kukui* nut, (377-9); the *awa* plant, (386-7); sandalwood, (402-3); Mauna Kea, (409-11).

#### *Account of the Kukui, by Ellis.*

As representative of Ellis' interesting and fruitful style, the following selections concerning the *Kukui* tree may be taken as typical:

"Large quantities of kukui, or candle nuts, hung in long strings in different parts of Arapai's dwelling. These are the fruit of the *aleurites triloba*; a tree which is abundant in the mountains, and highly serviceable to the natives. It furnishes a gum, which they use in preparing varnish for their tapa, or native cloth. The inner

bark produces a permanent dark-red dye, but the nuts are the most valuable part; they are heart-shaped, about the size of a walnut, and are produced in abundance. Sometimes the natives burn them to charcoal, which they pulverize, and use it, tatauing their skin, painting their canoes, surf-boards, idols, or drums; but they are generally used as a substitute for candles or lamps. When designed for this purpose, they are slightly baked in a native oven, after which the shell, which is exceedingly hard, is taken off, and a hole perforated in the kernel, through which a rush is passed, and they are hung up for use, as we saw them at this place. When employed for fishing by torch-light, four or five strings are enclosed in the leaves of the pandanus, which not only keeps them together, but renders the light more brilliant.

“When they use them in their houses, ten or twelve are strung on the thin stalk of the [rib of a] cocoa-nut leaf [leaflet], and look like a number of peeled chestnuts on a long skewer. The person who has charge of them lights a nut at one end of the stick, and holds it up, till the oil it contains is consumed, when the flame kindles on the one beneath it, and he breaks off the extinct nut with a short piece of wood, which serves as a pair of snuffers. Each nut will burn two or three minutes, and, if attended, give a tolerable light. We have often had occasion to notice, with admiration, the merciful and abundant provision which the God of nature has made for the comfort of those insulated people, which is strikingly manifested by the spontaneous growth of this valuable tree in all the islands; a great convenience is hereby secured, with no other trouble than picking up the nuts from under the trees. The tree is large, the leaves and wood remarkably white; and though the latter is not used by the Sandwich Islanders, except occasionally in making fences, small canoes are frequently made of it by the Society Islanders. In addition to the above purposes, the nuts are often baked or roasted as an article of food, which the natives eat with salt. The nut contains a large portion of oil, which, possessing the property of drying, is useful in painting; and for this purpose quantities are carried by the Russian vessels to their settlements on the north-west coast of America.”

*(To be continued.)*

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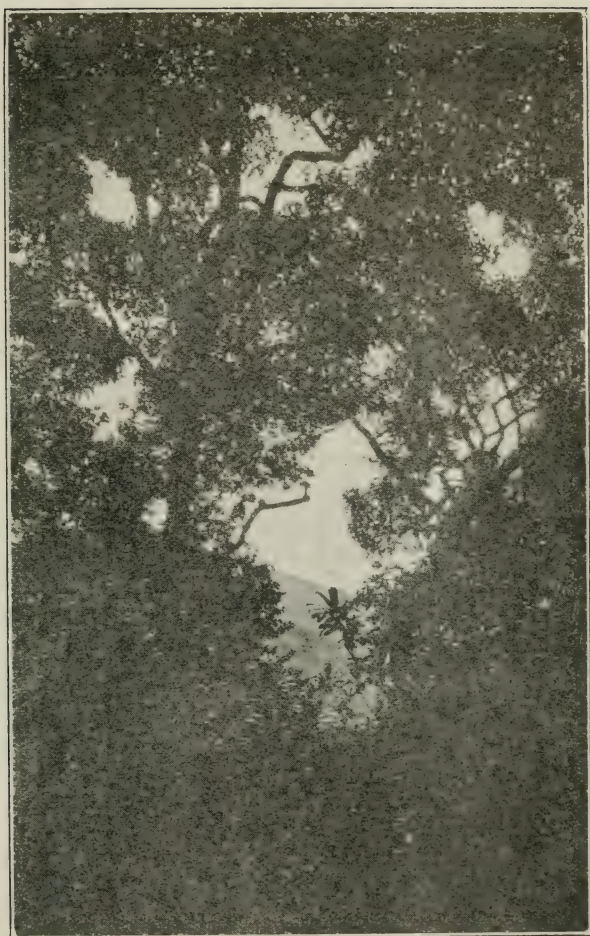
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

NOVEMBER, 1918

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XV.

HONOLULU, NOVEMBER, 1918.

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A perusal of the live stock sanitary laws of the states and territories on the mainland indicates that Hawaii stands high in the character of such laws and in their enforcement.

---

Koa trees are being used by the Division of Forestry in re-foresting the bare areas which were formerly covered with this tree at Kolekole Pass in the Waianae Range, Oahu.

---

The Forest Nurseryman distributed a total of 10,500 trees for planting throughout the islands on Arbor Day, which this year was celebrated on November 22.

---

Now that the tree planting season has arrived, the Forest Nurseryman is busily engaged in sending out large orders of trees mainly to the plantation companies.

---

It is noted in the report of the Chief Plant Inspector that wheat from Australia and rice from Siam have recently been imported to meet the demands for food in this Territory.

---

The Division of Plant Inspection has assisted in the saving of food by lending its fumigating facilities to rid rice, barley, wheat, corn, beans and rice bran of infestation.

---

Kahoolawe is to be leased again, but only under conditions which will assure the revegetation of the island which has been much maltreated in the past by overgrazing.

---

A publication on the corn leaf-hopper describing this pest and the beneficial insects which prey upon it, prepared by Entomologist D. T. Fullaway, will soon be issued with illustrations as Bulletin No. 4 of the Division of Entomology.

---

The proposed setting apart as a forest reserve of over 20,000 acres of ohia forest in Olaa, Hawaii, to prevent its becoming a waste of dead trees and Hilo grass is a step in the right direction of conservation.



Progress in the protection of our native forest in the reserves is announced in the reports of the Superintendent of Forestry, printed herewith, by the construction of new boundary fences and the repairing of existing fences at Hauula and Waiahole on Oahu, at Makawao on Maui, and at Glenwood on Hawaii.

---

The use of reenforced concrete posts on the new forest reserve fence at Glenwood, Hawaii, will present an interesting comparison of the serviceability of this material as against native fence posts made of the ohia.

---

The successful raising of the Benguet pine of the Philippines (*Pinus insularis*) at the Keanakolu Nursery at an elevation of 6000 feet on the slopes of Mauna Kea, Hawaii, gives promise of the possibility of raising at least a part of our own lumber supply in the future.

---

The inadvisability of cutting trails on the steep slopes of our forested mountains is proved by actual observations described in the October report of the Superintendent of Forestry. It is far better to follow the old Hawaiian custom of keeping to the tops of ridges.

---

On October 14, 1918, the Governor by executive order set aside for the exclusive use of this Board 6.51 acres of government land in Waiakea, Hawaii, for the animal quarantine station and 1988 square feet of government land on the Wailoa River in the town of Hilo for plant fumigation purposes.

---

The five new forest reserves on Kauai, Oahu and Hawaii, which the Superintendent of Forestry has just recommended for setting apart, aggregate a total area of 41,231 acres and, except for minor changes on the boundaries of existing reserves, will complete the forest reserve system for the Territory.

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Stock raisers and plantation stablemen through the Territory should be careful not to feed any moldy corn to their horses or mules. This causes forage poisoning for which there is no treatment and which usually results in a mortality of ninety per cent.

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The difficulties which confront the deputy territorial veterinarians in testing cattle for bovine tuberculosis in the outlying country districts are well set forth in the September report of the Territorial Veterinarian printed in this issue. The coöperation of the Board of Health officials in this work is very much appreciated.

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Of the 7426 head of dairy cattle tested for tuberculosis during the year ended September 30, 1918, a total of 6991 head, or 94.2

per cent, were found to be free of the disease. The bovine tuberculosis compensation act passed by the 1917 Legislature has greatly assisted in the suppression of this disease which it is hoped will in time be entirely eradicated from this Territory.

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During September, October and November, the Division of Entomology reared and distributed for liberation a total of 92,294 beneficial insects as follows: 16,150 parasites on the melon fly, 11,794 parasites on the fruit fly, 8350 parasites on the horn fly, and 56,000 parasites on the corn leaf hopper. Any of these parasites will be sent on application to those who are troubled with the insect pests enumerated above.

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The article, "History of Botanical Exploration in Hawaii," the first two instalments of which appeared in the September and October numbers, is by Professor Vaughan MacCaughy, of the College of Hawaii. The third instalment is crowded out of this number.

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## The Hawaiian Sumach

By C. S. JUDD, *Superintendent of Forestry.*

The Hawaiian sumach or Neneleau, *Rhus semialata* Murr. var *sandwicensis* Engl., belongs to a genus which has over 100 species widely distributed over the world, but which is most abundant in subtropical and temperate regions, chiefly in South Africa. In the United States the sumach is represented by 16 species widely scattered of which four attain the habit of small trees. These are most conspicuous in the fall of the year when their turning foliage brightens the landscape with colors of fire.

The resin-canals in the bark of the sumach are in general filled with a milky juice and the bark and leaves abound in tannin which is used in dressing leather. Some of the sumachs are poisonous, even to the touch, and the acrid poisonous juice of *Rhus vernicifera* D. C. of China furnishes the black varnish used in China and Japan in the manufacture of the much prized lacquer ware.

The species of which our sumach is a variety is a small tree which is found in the Himalaya Mountains of India up to 7000 feet and in China and Japan. In India the fruit is eaten by Nepalese and Pepchas who also make a vegetable wax of it called *Omlu*.

The Hawaiian sumach, which reaches a height of at least 25 feet, occurs in isolated clusters at the lower elevations and is found at Makaweli, Kauai, at Nuuanu and Hakipuu on Oahu, at Kailua, Auahi, Waiehu and Iao on Maui, and in the Kohala mountains, Hamakua, North Kona, and Hilo Districts on Hawaii. Ordinarily it is not a very gainly tree but when in blossom

the large panicles of fragrant white or pale yellow-green flowers are very attractive.

The wood of the Neneleau although soft and light and coarse-grained is very tough and durable in the soil. It has been used to advantage as ox yokes and has been found very serviceable as fence posts. The trunks of sumach trees on the Hamakua Coast on Hawaii have been found large enough to split into four fence posts and when used for this purpose they have the quality of being easy to split on account of their straight grain and easy to transport on account of their light weight.

With the idea of starting a small experimental plantation of the Hawaiian sumach for the production of fence posts, a request was sent to Bro. Matthias Newell, Nursery Agent at Hilo, for some seed. His instructive reply, which is as follows, calls attention to the presence of a fungus disease which has damaged the sumach and has been responsible for its decadence in many regions:

"I received your letter in which you ask for sumach seed. It is practically impossible to procure such seeds for they are extremely rare. For many years I have looked for some but so far have seen but very few and that only in one instance. Some years ago the sumach had been attacked by a fungus disease which killed all the old trees and still is destroying many of the younger plants every year. Were it not for the sumach reproducing by the roots, which are not attacked, there would be none left by this time. The disease attacks the trunks and branches, killing not at once but little by little.

"I could send many young plants that come up from the roots but that would not be advisable on account of the fungus.

"The sumach grows extensively on Maui, especially in the Iao Valley, where I have seen trees thirty and more feet high. Whether the disease has reached there, I cannot tell, but it would be well for you to investigate."

Since the Hawaiian sumach may be propagated by layers, root cuttings, or slips, an attempt will be made to start the proposed plantation in this manner rather than by the use of seedlings.

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## Division of Forestry

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Honolulu, Hawaii, November 13, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine reports of the Division of Forestry for the month of September 1918:

## FOREST FENCING.

The following fencing projects, aggregating a total length of 3.06 miles along forest reserve boundaries, have recently been completed:

On the boundary of the new addition to the Makawao Forest Reserve on Maui, under the supervision of Ranger Lindsay, the construction of .89 mile of new fence and the repairing of .53 mile of existing fence were completed on the last day of August.

On a part of the boundary of the new Waiahole Forest Reserve, Oahu, the construction of .59 mile of new fence was completed on September 18.

On a part of the boundary of the proposed new Hauula Forest Reserve, Oahu, across the government land of Hauula, the construction of a new fence begun on August 6, 1917, by voluntary homestead labor under an agreement made by the Land Commissioner was completed on September 28. The length of this fence on the boundary is .87 mile and in addition to this by special arrangement an additional length of .18 mile was constructed to prevent cattle from crossing on to government forest land from the adjacent private land of Kaipapau.

In addition to the above and not previously reported 1.19 miles of fence on the boundary of the Pupukea Forest Reserve, Oahu, was repaired in coöperation with the Ranch Department of the O. R. & L. Co.

I have also been informed that several of the fences required to be built or kept in repair by general leases and to which the attention of the Land Commissioner was recently called are being constructed, viz., the renewing of the fences on a part of the boundary of Molokaa Forest Reserve, Kauai, and the Kau Forest Reserve, Hawaii. Material for the Makua fence, Oahu, has been assembled at Lualualei, but has not yet been hauled over.

New padlocks have been placed on the gates of the boundary fence of the Lihue-Koloa Forest Reserve where it crosses the government land of Wailua, Kauai, and during the past few months over 60 head of wild cattle have been removed from the reserve by the Lihue Plantation.

During the middle part of the month on a two-day trip to Molokai I inspected the fences of the Molokai Forest Reserve where they cross government land, and upon my return sent to the Land Commissioner fencing clauses to be inserted in the new leases of these lands soon to be offered for sale.

## VISIT TO MANANA.

On September 6, in company with two Boy Scouts, I visited the island of Manana, commonly called Rabbit Island, off Makapuu Point, Oahu, and set up two wooden painted signs to warn people against any infringement of Rule IV which protects



bird, animal, and vegetable life on the island. Birds on the island were found in plenty and did not seem to have been disturbed for some time. An attempt was made to reach the adjacent smaller island of Kaohikaipu, but on account of the rough sea it was not possible to land.

#### FOREST PLANTING.

During the month on the Lualualei Forest Reserve, Oahu, at Kolekole Pass, the planting gang set out a total of 2444 koa trees on the slopes near the spring. In addition to this a few trees of miscellaneous species were planted to find out whether they would do well in the region.

#### HAWAII TRIP.

On September 21, I left for Hawaii and spent the remainder of the month and a part of the next in touring the island with the Governor and the Land Commissioner. A part of the island was seen to advantage and some new lands visited. Several land and forest matters along the Volcano Road in Olaa, and in Kona were looked into.

At Keanakolu it was a pleasure to see in the nursery 1500 seedlings of the Benguet pine, *Pinus insularis*, which were started for this Division by Mr. Alfred W. Carter two years ago, and are now from one to two feet high and about ready to plant out. Arrangements will soon be made to set these out at different elevations on the slopes of Mauna Loa in suitable spots to determine where they will grow the best.

In this same region the fences constructed in coöperation with the Kukaiau Ranch on the boundaries of government lands in the Hilo Forest Reserve at Piha and Laupahoehoe were inspected and found to be well built and in good condition.

Parts of two days were spent in examining the upper portion of the government land of Piihonua now occupied by the Puu Oo Ranch as well as the boundary of the Hilo Forest Reserve in this region. This boundary was found to be securely fenced against stock and the fence kept in good condition. No running streams occur above the boundary on this land except after heavy rains, and a part of the land is covered by an open forest of ohia and koa. The question of whether additional land should in the future be added to the reserve at this locality is a matter in which concerted action should be taken with the owners of privately owned lands to the north.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, October 23, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR:—I herewith submit a report of the principal work done during the month of September:

## NURSERY.

*Distribution of Plants.*

	In seed boxes	In trans- plant boxes	Pot grown	Total
Sold . . . . .	.....	.....	133	133
Gratis . . . . .	2600	250	570	3420
	<hr/> 2600	<hr/> 250	<hr/> 703	<hr/> 3553

## COLLECTIONS.

*Government Realizations.*

Collections on account of plants sold.....\$ 3.00

*Preservation Forest Reserves.*

Collections for quarter ended Sept. 30, 1918—

Rents and fees.....\$42.50

Sale of 52 loads of black sand at 50c per load. 26.00

Total.....\$68.50

*Plantation Companies and Other Corporations.*

The distribution of plants under this heading amounted to 40,000 in seed boxes and 5,000 in transplant boxes, making a total of 45,000.

*Makiki Station.*

A commencement has been made to utilize the trees which we cut a short time ago along the Tantalus road. The Monkeypod we are cutting up into seed and transplant boxes. The different species of encalyptus are being cut into fence posts, and will be tested with the object of finding out the durability of each species. We have in stock large quantities of trees now ready for the coming planting season and Arbor Day.

*Honolulu Watershed Planting.*

The cutting and pruning of the trees along the Tantalus road running through the planted forest occupied most of the time during the month. The work is now finished and should the county officials see their way clear to do a little repair work on the road it would greatly benefit those who have to travel over it.

*Advice and Assistance.*

The writer has made visits and otherwise given advice and assistance as follows:

Calls made, 6; advice by telephone, 8; advice given at Nursery, 10.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## REPORT FOR OCTOBER.

Honolulu, Hawaii, November 18, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of October, 1918:

*Hawaii Trip.*

From the first of the month to October 8, I was still on Hawaii with the Governor's party making an inspection of government lands. The following received my special attention:

In company with County Engineer A. C. Wheeler I looked over the lower boundary of the Hilo Forest Reserve on the government land of Piihonua. The koa trees which were reported to have been attacked during the previous summer by a defoliating moth had entirely recovered and were in apparently good condition. Several miles of the boundary were examined and it was ascertained that additional land too high for cane and too heavily forested for homesteads could well be added to the reserve. During the next dry season it is planned to have the boundary on Piihonua relocated by a Government surveyor so as to include these lands in the reserve and ascertain just where fencing will be needed. This is an important project because the area is all tributary to the domestic water supply of the town of Hilo.

With Forest Ranger A. J. W. Mackenzie I made arrangements for fencing up the pieces of land in Sec. C. of the Olaa

Forest Park Reserve on the Volcano Road between Glenwood and approximately  $23\frac{1}{2}$  Miles. On these small strips, which are only 150 feet deep adjacent to both sides of the road, there remain in places some attractive bits of native tree fern and ohia forest which always receive the interested attention of those passing along the road to visit the Volcano. These pieces of forest are gradually diminishing on account of the dairy cattle which wander at large through them and unless they are protected now they will soon disappear entirely. On this fencing which will amount to about 14,532 feet in length an opportunity has been presented to test the efficiency of reenforced concrete posts, a supply of which I was able to purchase already made in Hilo at 60 cents each which is cheaper than the present price of redwood posts. This fence will probably be completed before the end of the year after which it is planned to fill in the blank spaces with native loulu palms and other suitable trees.

Two days were also spent in examining a large tract of government forest land in upper Olaa with the idea of placing it in a new reservation to be called the Olaa Forest Reserve. This will probably comprise about 25,000 acres and embraces a tract of dense ohia forest which has been surveyed for homesteads in the past, but on which after repeated attempts homesteading has proved to be a failure, mainly on account of the shallowness of the soil. In the past few years a few general leases have been made of parts of this tract for grazing a few head of scrubby cattle, but rather than to have the forest destroyed in this manner and become a waste of Hilo grass and dead trees it is my aim to include it all in a reserve and to protect it by the necessary fencing. At present a government surveyor is on the ground obtaining the courses of a few lines necessary to complete the description and the project will soon be presented for your approval.

### *Maui Trip.*

From October 16 to 24 I was on the island of Maui inspecting government lands in company with the Governor and Land Commissioner. All portions of the island with the exception of the very eastern end were visited. The native forest between Keanae and Kailua, which had died down over 10 years ago, is still coming back in a most satisfactory manner and the young ohia and other native trees will soon replace those which succumbed to the previous trouble.

### *Trail Inspection.*

On October 11, in company with Entomologist Fullaway, I made an inspection of the trail which was constructed some years ago on the Honolulu Watershed Forest Reserve beginning at the head of Pauoa Valley and running toward Konahuanui



and then across Olympus and down the ridges to Woodlawn, with the idea of ascertaining whether it was the primary cause of landslides.

The forest in this whole region is in excellent condition with the exception of where the earth on steep slopes has slipped, and this naturally has caused the trees to be uprooted and carried down. A count was made of all the slides on a strip a quarter of a mile wide on both sides of the trail and it was found that of the total of 46 slides, 32 or 70% were in no way caused by the construction of the trail, most of them being far distant from it. The other 14 slides along the trail were caused either by the direct effect of undermining the bank so deep as to cause an overhang and consequent fall of earth or by the indirect effect of the trail forming a ditch from which the water poured over the slope below, washed down the dirt, and kept the vegetation from growing. No recent slides were observed and the older slides have been rather rapidly grown over with low vegetation. In some places the trail is very narrow, but since further cutting into the bank with the consequent forming of more overhang will probably result in further slides of earth, trail repairing will not be permitted neither will the construction of new trails on any slopes in this region be allowed.

#### *New Lease of Kahoolawe.*

At the request of the Land Commissioner I prepared a series of clauses to be inserted in the new lease of the island of Kahoolawe from a term of 21 years from January 1, 1919, which will be offered for sale on December 10. These require first that all goats and sheep must be removed or exterminated during the first year and that when this is accomplished the lessee may graze 300 head of beef cattle on the island for fattening purposes and maintain 20 head of riding and pack animals. Troughs are to be placed so as to keep the stock in the grassed areas, every effort is to be made to prevent and suppress fires and a monthly record of the rainfall on the island is to be kept. The lessee is to plant and care for trees and to fence them in as a protection against stock on locations to be selected by the Superintendent of Forestry, and up to 5 acres each year are to be planted in this manner. Strict compliance with all of these conditions will be required and it is believed that the vegetation of the island will advance under these new conditions.

#### *Kokee Camps.*

You have already been furnished with a copy of the letter of October 18 from the Kauai Chamber of Commerce protesting against the rates to be charged for the Kokee Camps in the Na Pali-Kona Forest Reserve and against the requirement of a bond with the permit and asking for a reconsideration of the regula-

tions. A special committee of the Chamber has been looking further into the subject and a report is expected from them after the next regular meeting of this Chamber to be held in December.

### *Forest Planting.*

During the month Ranger Lovell planted 200 swamp mahogany trees on the Kealia Reserve, Kauai, and the other planting gangs cleared new land for planting and dug holes for trees.

A supply of 12 lbs. of seed of the New Zealand karaka tree, *Corynocarpus laevigata*, which makes a good watershed cover, was obtained from Kauai through Ranger Hardy and 3 lbs. were handed over to the H. S. P. A. for use in reforestation work in their Kohala unit of forest operations. The remainder was distributed to Rangers Mackenzie and Lindsay for planting on reserves and to interested tree planters living at the higher elevations on Hawaii.

### *Sugar Loaf Forest.*

On October 28, I took Governor McCarthy along the trails on Sugar Loaf and showed him the koa forest planted by this Division five years ago. The trees which were planted 14 by 15 feet apart now form a complete crown canopy over the ground and compose as charming a young forest as one would wish to see. The Governor was very much delighted with it and much enlightened as to the suitability of our native koa for reforestation purposes.

### *Arbor Day.*

On Friday, November 22, the annual celebration of Arbor Day will be observed. In preparation for this, the Forest Nurseryman has prepared a stock of trees for distribution to those who desire to plant on this day.

### *New Forest Reserves.*

During the month reports on five proposed new forest reserves were completed and are submitted at this time for your consideration. They are the Nonou and Puu Ka Pele on Kauai, the Mokuleia and Hauula on Oahu and the Olaa on Hawaii.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, November 14, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR:—The following report gives the principal work done during the month of October:

## NURSERY.

*Distribution of Plants.*

Sold.....	52	pot grown plants.
Gratis.....	100	in transplant boxes.
“ .....	859	pot grown.
<hr/>		
Total.....	1011	plants.

## COLLECTIONS.

Collections in account of plants sold.....	\$ 1.30
Rent of office building, Nursery grounds, for July	35.00
<hr/>	
Total.....	\$36.30

*Plantation Companies and Other Corporations.*

The distribution of plants under this heading amounted to 100 pot grown plants.

*Makiki Station.*

The work done at this station has been as follows:

Mixing and sterilizing soil, potting and transplanting trees, cutting up wood for boxes, also laths for making crates, etc.

*Honolulu Watershed Planting.*

The work on the watershed has been confined to clearing off and making holes for trees, clearing trails, etc.

*Advice and Assistance.*

The writer made two trips to Schofield Barracks at the request of Captain Atkinson and General Heard. Advice was given on the planting and laying out of grounds around the General's headquarters.

Other calls were made at the request of people in and around the city.

Calls made, 6; advice by telephone, 8; advice to people calling, 7.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## REPORT FOR NOVEMBER.

Honolulu, Hawaii, December 5, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :—I respectfully submit the following routine report of the Division of Forestry for the month of November, 1918:

### FOREST FENCING.

Ranger Mackenzie reports that up to November 23, he had completed over  $1\frac{1}{2}$  miles of the new fence around parts of the Olaa Forest Park Reserve along the Volcano Road near Glenwood, Hawaii.

On Maui, the Haleakala Ranch Company during the month repaired 1.31 miles of the fence on the boundary of the Makawao Forest Reserve near Olinda.

During the month I made an inspection of the Hauula and Waiahole Forest Reserve fences on Oahu and arranged for the repair of the old fence on the boundary of the Waiahole Reserve adjacent to Kaalaea.

### FOREST PLANTING.

The planting gang at Mikilua on the Lualualei Forest Reserve, Oahu, planted out during the month on the drier locations the following trees:

Gum Arabic, <i>Acacia arabica</i> .....	228
Black locust, <i>Robinia pseudacacia</i> .....	100
Yellow poinciana, <i>Peltophorum inerme</i> .....	73
Kassod tree, <i>Cassia siamea</i> .....	125
Logwood, <i>Haematoxylum campechianum</i> .....	538
	<hr/>
	1,064

These are trees which it is believed will succeed in the drier regions of which this locality is typical besides being useful for cover and other purposes, and it is planned to test them out here before planting them out very extensively.



Instructions were sent to Ranger Lindsay to prepare for planting this winter on the Waihou Spring Reserve, Maui, a small reserve of 84 acres on the slopes of Haleakala of which 74 acres are government land.

#### ARBOR DAY.

Arbor Day was celebrated on November 22, and for planting on this occasion the Forest Nurseryman distributed 10,500 trees throughout the Territory.

#### FOREST FIRE.

On November 8, a grass and brush fire occurred from causes unknown on the military reservation on the South Fork of the Kaukonahua River, Waianae-uka, near the pipe intake of the U. S. Reservoir, on the same area as the fire of June 25, 1917. About 25 acres were burned over before it was extinguished in two hours by a troop of cavalry assisted by a shower of rain.

#### REMOVAL OF STOCK.

Notice was sent to the Knudsen Brothers of Kauai to remove a number of horses which they were pasturing on unleased government land on Kumuwela Ridge within the Na Pali-Kona Forest Reserve.

#### ADVISORY COMMITTEE.

On November 29, I attended a meeting of the Advisory Committee on Forestry of the H. S. P. A. at which plans were discussed for coöperative work in the protection and reforestation of watersheds in which sugar plantations and the government are both interested.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

#### REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, December 6, 1918.

Superintendent of Forestry, Honolulu.

DEAR SIR:—I hereby submit a report of the work done during the month of November:

## NURSERY.

*Distribution of Plants.*

	Pot grown	In trans- plant boxes	Total
Sold .....	252	1700	1952
Gratis .....	157	....	157
	<hr/> 409	<hr/> 1700	<hr/> 2109

The total number of trees distributed for Arbor Day planting, November 22, 1918, amounted to 10,500. The attached table gives the number of trees sent to each island.

*Collections.*

Collections on account plants sold.....	\$ 4.50
Rent of office, Nursery grounds for August and September .....	70.00
Total.....	<hr/> \$74.50

*Plantation Companies and Other Corporations.*

The distribution of plants under this heading amounted to 1000 in transplant boxes and 5000 in seed boxes.

*Makiki Station.*

The work done at this station has been principally routine. Slight damage was done to our roads and trails by heavy rains. Repairs have been made and they are again in fairly good condition.

*Honolulu Watershed Planting.*

During the month 685 koa trees were planted. Other work consisted of making holes and hoeing trees.

*Advice and Assistance.*

The writer has been called upon to give advice to people in and around the city, as follows:

Advice given by telephone, 4; advice given people calling, 6; visits made, 6.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## ARBOR DAY, NOVEMBER 22, 1918.

Table giving the number of applications received and trees distributed for Arbor Day.

	Applications		Applications		
	Schools	Trees	Others	Trees	Total
Oahu . . . . .	12	329	207	3999	4328
Hawaii . . . . .	7	540	140	3362	3902
Maui . . . . .	6	130	54	1080	1210
Kauai . . . . .	6	104	35	832	936
Molokai . . . . .	1	124	...	...	124
	<hr/> 32	<hr/> 1227	<hr/> 436	<hr/> 9273	<hr/> 10,500

Included in the total number of trees given out, 788 children called at the Nursery on Arbor Day and each received one tree.

## Division of Entomology

Honolulu, Hawaii, September 30, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month of September the insectary handled 23,400 pupae of the melon fly, from which there were bred 2,264 females and 1,816 males *Opius fletcheri*.

The distribution of parasites was as follows:

### *Opius fletcheri*.

	Females	Males
Oahu:		
Wahiawa . . . . .	200	140
Moanalua . . . . .	1200	800
Makiki Nursery . . . . .	300	160
Hawaii:		
Kapoho . . . . .	330	240
Hilo . . . . .	300	220

### *Diachasma fullawayi*.

Oahu:		
Kaimuki . . . . .	15	10
Kalihi Valley . . . . .	56	45
Hawaii: Hilo . . . . .	20	5

*Tetrastichus giffardianus.*

Oahu:		
Kaimuki . . . . .	100	
Kalihi Valley . . . . .	1100	
Hawaii:		
Kapoho . . . . .	200	
Hilo . . . . .	300	

*Diachasma tryoni.*

Oahu:		
Kaimuki . . . . .	75	160
Kalihi Valley . . . . .	400	220
Hawaii:		
Hilo . . . . .	160	95
Kohala . . . . .	100	65
Kapoho . . . . .	250	200

*Philippine Pteroramalid.*

Maui: Paia . . . . .	700
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*Spalangia cameroni.*

Maui: Paia . . . . .	1300
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*Paranagrus osborni.*

Oahu: Makiki Nursery . . . . .	14,000
Hawaii:	
Kamuela . . . . .	5,000
Kohala . . . . .	900

Respectfully submitted,

DAVID T. FULLAWAY,  
Entomologist.

## REPORT FOR OCTOBER.

Honolulu, Hawaii, October 31, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month of October the insectary handled 30,100 pupae of the melon fly, from which there were bred 2,662 females and 2,249 males *Opius fletcheri*.

The distribution of parasites was as follows:



*Opius fletcheri.*

	<i>Females</i>	<i>Males</i>
Oahu:		
Manoa . . . . .	870	900
Makiki Nursery . . . . .	145	170
Hawaii:		
Honokaa . . . . .	920	775
Kamuela . . . . .	395	540
Hilo . . . . .	1865	1730

*Opius humilis.*

Oahu:		
Manoa . . . . .	30	45
Kalihi . . . . .	40	50

*Diachasma fullawayi.*

Oahu:		
Manoa . . . . .	58	17
Kalihi . . . . .	70	46

*Diachasma tryoni.*

Oahu:		
Manoa . . . . .	55	30
Kalihi Valley . . . . .	540	327

*Tetrastichus giffardianus.*

Oahu: Kalihi Valley . . . . .	2,300
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*Spalangia cameroni.*

Hawaii: Kohala . . . . .	700
Maui: Paia . . . . .	3,400

*Galesus silvestri.*

Hawaii: Mt. View . . . . .	700
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*Paranagrus osborni.*

Oahu:		
Makiki Nursery . . . . .	11,400	
Moiiliili . . . . .	800	
Hawaii:		
Kohala . . . . .	2,300	
Kamuela . . . . .	5,300	

Respectfully submitted,

DAVID T. FULLAWAY,  
Entomologist.

## REPORT FOR NOVEMBER.

Honolulu, Hawaii, December 6, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :—During the month of November the insectary handled 22,700 pupae of the melon fly, from which there were bred 1,885 females and 1,442 males *Opius fletcheri*.

The distribution of parasites was as follows:

*Opius fletcheri*.  
(Melon Fly Parasite.)

	Females	Males
Oahu:		
Manoa . . . . .	700	725
Moiliili . . . . .	495	450
Paumalu . . . . .	300	195
Hawaii:		
Kamuela . . . . .	120	70
Honokaa . . . . .	475	400

*Diachasma tryoni*.  
(Fruit Fly Parasite.)

Oahu: Kalihi Valley . . . . .	745	410
Maui: Wailuku . . . . .	110	80

*Diachasma fullawayi*.  
(Fruit Fly Parasite.)

Oahu: Kalihi Valley . . . . .	195	90
Maui: Wailuku . . . . .	35	20

*Opius humilis*.  
(Fruit Fly Parasite.)

Oahu: Kalihi Valley . . . . .	395	305
Maui: Wailuku . . . . .	80	95

*Tetrastichus giffardianus*.  
(Fruit Fly Parasite.)

Oahu: Kalihi Valley . . . . .	1,150
Maui: Wailuku . . . . .	200

*Spalangia cameroni*.  
(Horn Fly Parasite.)

Maui: Paia . . . . .	1,750
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*Philippine Pteromalid.*  
(Horn Fly Parasite.)

Maui: Paia ..... 500

*Paranagrus osborni.*  
(Corn Leaf Hopper Parasite.)

Oahu:

Makiki Nursery ..... 16,300  
Moiliili . ..... 2,700  
Kailua . ..... 3,900  
Hawaii: Kamuela ..... 3,400

Respectfully submitted,

DAVID T. FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, September 30, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of September, 1918, as follows:

During the month there arrived at the Port of Honolulu 53 vessels, of which 21 carried vegetable matter, one carried sand and one vessel came via the Panama Canal. The following disposal was made of the various shipments:

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	287	8,963
Fumigated . . . . .	3	703
Burned . . . . .	20	22
Returned . . . . .	3	3
Total inspected.....	313	9,691

Of these shipments 9,560 packages arrived as freight, 82 as mail and 49 packages as baggage.

### RICE AND BEAN SHIPMENTS.

During the month 22,244 bags of rice, 6,130 bags of beans and 700 bags of wheat arrived from foreign ports, including a shipment of 10,000 bags of rice from Siam. The rice and beans

were apparently free from pests. The wheat, which came from Australia, was infested with several species of weevil which infest stored grain and was fumigated before delivery.

#### PESTS INTERCEPTED.

Approximately 6,662 pieces of foreign baggage belonging to passengers and immigrants were examined. From this baggage 14 lots of fruit and 9 lots of vegetables were taken and burned.

On September 8, a package of peach pits in the mail from Japan was returned by the postal authorities as unmailable.

On September 21, a package of fruit in the mail from Japan was also returned as unmailable.

On September 30, a package of orchids in the mail from Mexico being prohibited was burned at the request of the consignee.

For the accommodation of local merchants we have fumigated during the month of September the following infested cereals: 4,903 bags rice; 600 bags barley; 1,144 bags wheat; 656 bags corn; 9 bags beans and 148 bags rice bran, making a total of 7,460 bags.

#### HILO INSPECTION.

Brother M. Newell reports the arrival of six vessels at the Port of Hilo, two of which carried vegetable matter consisting of 121 lots and 1,795 parcels. All were found apparently free from pests and passed.

#### KAHULUI INSPECTION.

Mr. Will J. Cooper reports the arrival of five vessels at the Port of Kahului, one of which carried matter subject to inspection consisting of four lots and 58 packages, all of which were found to be free from pests.

#### INTER-ISLAND INSPECTION.

Fifty-eight steamers plying between Honolulu and other island ports were attended and the following shipments were passed as free from pests:

Taro . . . . .	537	bags
Vegetables . . . . .	331	packages
Fruit . . . . .	12	"
Plants . . . . .	106	"
<hr/>		
Total passed . . . . .	986	"



Five packages of plants and seven packages of fruit were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

## REPORT FOR OCTOBER.

Honolulu, Hawaii, October 31, 1918.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of October, 1918, as follows:

During the month there arrived at the Port of Honolulu 58 vessels, of which 18 carried vegetable matter subject to inspection and one carried sand. The following disposal was made of the various shipments:

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	436	22,987
Fumigated . . . . .	2	9
Burned . . . . .	6	6
Returned . . . . .	0	0
Total inspected.....	444	22,995

Of these shipments 22,883 parcels arrived as freight, 76 packages as baggage and 33 packages as mail.

### RICE AND BEAN SHIPMENTS.

During the month 12,925 bags of rice and 907 bags of beans from foreign ports were inspected and found apparently free from pests.

### PESTS INTERCEPTED.

Approximately 2,797 pieces of foreign baggage belonging to passengers and immigrants were examined. From this baggage 4 lots of vegetables and 1 lot of fruit were taken and burned.

On October 23, a package of sugar cane in the baggage from China was burned. On October 26, two parcels of acorns and chestnuts in the mail were fumigated for weevils.

During October we fumigated the following cereals, etc., for the accommodation of local merchants: 1,500 bags rice, 458 bags corn, 4,000 bags flour, 480 bags middling, 7 bags barley, 44

bags corn meal, 35 bags beans, 8 bags algaroba beans and 19 bags dried awa root, making a total of 6,551 bags.

#### HILO INSPECTION.

Brother Newell reports the arrival of 5 steamers at the port of Hilo, 3 of which carried vegetable matter consisting of 112 lots and 2373 packages. With the exception of 2 palms in the mail which were fumigated for mealy bug, all were passed as free from pests. The Anyo Maru arriving direct from Japan brought 3,561 bags of rice, beans and seeds, all of which were passed.

#### KAHULUI INSPECTION.

Mr. Will Cooper reports the arrival of three vessels at the Port of Kahului, one of which carried vegetable matter consisting of 29 lots and 285 packages, all of which were passed as free from pests.

#### INTER-ISLAND INSPECTION.

Sixty-one steamers plying between Honolulu and other island ports were attended and the following shipments were passed as free from pests:

Taro . . . . .	610	bags
Vegetables . . . . .	260	packages
Fruit . . . . .	162	"
Plants . . . . .	62	"
		<hr/>
Total passed . . . . .	1,094	"

Three packages of plants and two packages of fruit were refused shipment on account of infestation and of undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

#### REPORT FOR NOVEMBER.

Honolulu, Hawaii, December 7, 1918.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month ending November 30, 1918, as follows:

During the month there arrived at the port of Honolulu 48 vessels, of which 19 carried vegetable matter subject to inspection. Two vessels arrived via Panama. The following disposal was made of the various shipments:

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	628	30,720
Fumigated . . . . .	4	505
Returned . . . . .	4	878
Burned . . . . .	24	24
Total inspected.....	660	32,127

Of these shipments 31,995 parcels arrived as freight, 95 parcels as mail and 37 parcels as freight.

#### RICE AND BEAN SHIPMENTS.

During the month 46,553 bags of rice and 2,838 bags of beans from foreign ports were inspected and found apparently free from infestation. 496 bags of wheat from Australia were found infested with a cosmopolitan grain weevil and fumigated before delivery.

#### PESTS INTERCEPTED.

Approximately 2,409 pieces of baggage belonging to passengers and immigrants from foreign ports were examined, from which 12 lots of fruit and 8 lots of vegetables were taken and destroyed by burning.

On November 7, 12 packages of seeds in the mail from Manila, consigned to the Hawaii Experiment Station and the Board of Agriculture and Forestry were fumigated as a precaution. Included in shipment were two packages of Job's tears and two packages of citrus seeds, which were burned, being prohibited by regulation of the Federal Horticultural Board.

On November 12, a parcel of flower seed in the mail from New Zealand was fumigated before delivery as a precaution.

On November 24, one package of tree seed, one package of peony roots and one package of chestnuts in the mail from Japan were refused entry by the United States Post Office as unmailable.

On the same date a consignment of 875 fruit trees from Japan were refused entry owing to the failure of the importer to comply with the regulations of the Federal Horticultural Board which requires shipments of plants from foreign countries to bear a certificate of inspection.

For the accommodation of local merchants we have fumigated the following cereals during November:

Barley 1 bag; beans 61 bags; corn 591 bags; corn meal 22

bags; middlings 1,049 bags; rice 1,105 bags, and wheat 992 bags, making a total of 3,821 bags.

#### KAHULUI INSPECTION.

Mr. Will J. Cooper reports the arrival of four vessels at the port of Kahului, one of which carried vegetable matter consisting of 20 lots and 520 packages, all of which were passed as free from pests.

#### INTER-ISLAND INSPECTION.

Fifty-eight steamers plying between Honolulu and other island ports were attended to and the following shipments were passed as free from pests:

Taro . . . . .	814 bags
Vegetables . . . . .	117 packages
Fruit . . . . .	32 "
Plants . . . . .	101 "
Total passed . . . . .	1,064 "

Four packages of fruit and nine packages of plants were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry

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Honolulu, Hawaii, October 28, 1918.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of September, 1918:

#### BOVINE TUBERCULOSIS CONTROL.

From the appended report of the Assistant Territorial Veterinarian it will be seen that 57 dairies, all in Honolulu, were tested during the month. Of these dairies 44, with an aggregate of 522 cattle, were found free of tuberculosis, while 13, aggregating 300



head, contained 29 reactors. Of these 13, 6 with a total of 141 head, contained but one reactor each, with the removal of which and the disinfection of the premises, the same may be classified as clean. Of the remaining 7 infected herds, Yamashita's, with 7 reactors out of 54, shows a decided improvement over last year, when he had 33 reactors out of 67.

#### BOVINE TUBERCULOSIS COMPENSATION ACT.

Owing to the anthrax epidemics of last year the enforcement of the Bovine Tuberculosis Compensation Act could not be taken up until the more dangerous disease had been brought under control. As the actual testing under the new law was begun the first week of October, 1917, it might be of interest to see what has been accomplished during the year ending September 30th, 1918, and how much of the appropriation of \$20,000 has been expended during this period.

#### NUMBER OF CATTLE TESTED, PASSED, CONDEMNED, APPRAISED, SLAUGHTERED, OCT. 1ST, 1917, TO SEPT. 30TH, 1918.

No. of cattle tested.....	7,426
“ “ “ passed .....	6,991
“ “ “ condemned, appraised & slaughtered .....	435
“ “ carcasses found affected with tuberculosis .....	433
“ “ “ not affected with tuberculosis....	2
“ “ “ totally condemned .....	15
“ “ “ partly condemned .....	12
“ “ “ passed for food after removal of lesions .....	414

Appraised value of 435 condemned cattle....	\$39,060.00
Beef value received for 433 condemned cattle.	16,723.78
Compensation paid owners by Territory.....	14,206.37
Total value received by owners.....	30,930.15

Average appraised value.....	\$90.75
“ beef value .....	39.00
“ compensation .....	33.00
“ value to owner (beef and compensation) .....	72.00

#### SUMMARY.

Total appropriation, Act 121, Ses. Laws 1917	\$20,000.00
Compensations paid .....	\$14,206.37
Appraisers .....	210.00
Incidentals .....	99.75
	14,516.12

Balance Sept. 30th, 1918.....\$ 5,483.88

The owner's compensation is compounded on the basis of the

appraised value and in accordance with the extent to which the condemned animal is found to be affected with the disease when butchered. If no disease is found the owner receives from the Territory the full appraised value less the market value he receives for the carcass. In only two cases out of 435 animals reacting to the test were no tuberculosis lesions found on post mortem examination.

If an animal is found to be affected with tuberculosis but the lesions are of such nature that the carcass is passed for food, the owner receives eighty per cent of the appraised value, less the market value of the carcass, which he receives from the butcher. If the carcass is condemned as unfit for food the owner receives fifty per cent of the appraised value, less what he can sell the hide for.

This arrangement is very fair and is approved by the federal Bureau of Animal Industry as well as by practically all state and municipal authorities now engaged in bovine tuberculosis control work. It is, however, obvious that the actual amount of compensation to be paid depends, to a certain extent at least, upon the price obtained for the carcasses which are passed for food, and while the law specifies that "the owner shall sell the same (the carcass), including all accompanying parts, at a fair market price," it is equally obvious that the owner is in no way interested in what the carcass brings, as he will be no better off whether it sells for 12 cents or 15 cents per pound. We have therefore made it a rule to notify a number of butchers of the time and place when reacting cattle are to be appraised, and have, especially during the recent shortage of beef, obtained for the owner prices which could never have been realized at a private sale. At the last appraisal, for instance, four different firms overbid each other on a small bunch of very ordinary milch cows, until the owner accepted 17½ cents per pound. We have thereby obtained for the owners of condemned cattle the sum of \$30,930.15 at a total expenditure to the Territory of only \$14,516.12, and leaving an unexpended balance of \$5,483.88, which is believed to be ample for all purposes until the next legislature shall meet.

While by far the greater part of the appropriation so far expended has been used right here in Honolulu, it should be borne in mind that not alone is the majority of all the dairy cattle in the Territory located right here, but also that this is the hotbed of the disease we are fighting.

And when it is further considered that out of 435 head of cattle condemned this past year alone, almost two-thirds, or 281 head, have come from three dairies, or that more than half of them, or 241 head, have come from two local dairies, then it is obvious that Honolulu is the place where the appropriation can be spent to best advantage. At the same time nearly ninety per cent of all dairy cattle on Oahu have been tested under Act 121 at least once, while many, and especially the most infected dairies, have been tested twice.

On the other islands, where our deputies have to make a living as practicing veterinarians, and at the same time attend to their official duties much less testing has been done. Regular dairy herds are maintained in very few places, the greater part of the milk production in both rural and urban districts and communities coming from the so-called family cows. In towns like Hilo, Wailuku, Lahaina, Lihue and Waimea, there is of course more or less actual dairy business, while practically every plantation maintains either a dairy herd or else a bunch of cattle from which fresh cows are brought in for gentling as well as for milking purposes. When, therefore, one practicing veterinarian has to inject and examine all of the dairy animals on an island like Maui or Kauai, or on half of an island like Hawaii, the examination to be made on the third day after injection, the reactors then to be branded, an appraiser appointed and brought to the premises where are the reactors, a butcher to be found who possibly (in rural districts, probably) will kill only one animal per week, the veterinarian to be present at all these functions, the scene of which may be laid from fifty to one hundred miles from where he lives, not counting the islands of Molokai or Niihau, then it will be seen that there are difficulties in administering Act 121, outside of this island, which are not easily overcome. The plantation herds and regular dairies can be attended to without much difficulty so long as there is a desire to coöperate and get the work done. It is the numerous family cows, one, two or three to the stable (shed, back yard or pen), which are out all day finding their feed along highways, ditches or any unfenced land, and which come home with a little milk in the evening, receive some feed and are turned out again as soon as they are milked in the morning. Then there are always some calves, yearlings and other young stock which are rarely seen by the owner from the time they are branded until the heifers calve. To get word to these owners—all of them in any one district—on a given day to not alone keep up the cows until the doctor arrives, but to round up, bring home and hold all the young stock, dry cows and bulls, to make them understand that unless *all* are tested the disease may remain and again spread from a single untested animal—that the doctor cannot come back the next day to inject those not kept up, as he will then be testing another district—that it will cost as much in miles traveled and time wasted to come back to do one cow as to do all the cows in that neighborhood—to convey all of this to many small milk producers of various nationalities, some of them day laborers, all of them with their day's work laid out before them—requires patience and tact, and sometimes firmness. But it can be done. From the August and September reports of the Deputy Territorial Veterinarian at Hilo the following is quoted:

“Two weeks testing has only yielded about 112 tests. Also the 8 Hilo dairies. Sometimes a convenient loss of memory—“did not know the doctor was coming today”



—or “gate pilikia, six cows run long way outside” and the patient doctor sits for a couple of hours in the hot sun while a dozen Japanese chase all over the pastures.

“The law works admirably—no trouble with owners, and usually they are satisfied.

“Tests are working out fairly well. Twenty-five reactors out of 560 tested for 160 owners. Have still to cover upper Olaa, Glenwood, Kau and Hamakua road from Pepeekeo to Kukuihaele, a large herd in Kaumana and some dairy retests.

“Compensation puts an entirely different aspect into testing. It is a pleasure now instead of a worry.

“Off for Kau Monday, testing expedition.”

As already stated the notification of the owners to have the cattle in at a given time is not the least difficult part of testing. This part, however, has been assumed almost entirely by the Board of Health. The “Sanitary Code” of the Territory requires tuberculin testing of dairy cattle before the issuance of a milk license. The said Board has at its disposal local agents, sanitary inspectors, and patrol men in practically every district in the Territory, men who can be reached by telephone and who know every cow owner, in their respective locations. This co-operation of the Board of Health, through its local officers and employees, has therefore assisted materially in carrying into effect the aim of Act 121, that is, the eradication of bovine tuberculosis, and this does not apply to the Hilo district alone, but may be counted on whenever the various deputies of this office are ready to take up tuberculin testing.

Respectfully submitted,

VICTOR A. NØRGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, September 30, 1918.

Dr. V. A. Nørgaard, Chief, Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu, T. H.

SIR:—I have the honor to submit the following report for the month of September:

### *Tuberculosis Control.*

The following dairy cattle were tested during the past month:

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
C. W. Lucas.....	9	9	0
S. I. Shaw.....	25	23	2
A. Rodriques .....	13	13	0
A. F. Cooke.....	5	5	0



	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
A. Reinecke .....	3	3	0
Capt. Hartman .....	3	3	0
Fred Luning .....	33	29	4
A. Pacheco .....	12	12	0
K. Yamashita .....	54	47	7
F. Nabarita .....	1	1	0
John Gonzallas .....	16	16	0
M. T. Brazon .....	52	51	1
S. Tsudo .....	34	34	0
T. Nakamura .....	13	12	1
M. S. Teixeira .....	12	9	3
A. Compos .....	11	11	0
Joe Rego .....	8	8	0
R. Compos .....	1	1	0
F. Fugisue .....	23	23	0
M. Salado .....	18	18	0
R. A. Franco .....	15	15	0
M. G. Lopez .....	6	4	2
Pedro Diaz .....	21	20	1
J. Domingo .....	4	4	0
J. Pedro Alias .....	6	6	0
A. Bonizo .....	6	6	0
J. Simon .....	36	36	0
S. Shimidzu .....	19	19	0
S. Hiarata .....	41	40	1
Pedro Martina .....	17	17	0
S. Saiki .....	13	12	1
M. Nishimoto .....	17	17	0
C.A. Long .....	12	12	0
Girls' Industrial School ..	10	10	0
M. Nee .....	25	22	3
K. Inouye .....	33	33	0
T. F. Farm .....	30	30	0
C. Ikeda .....	20	20	0
I. Otohey .....	4	2	2
P. Miyakawa .....	12	12	0
J. E. Monte .....	10	10	0
J. Maldanado .....	11	11	0
K. Kailianu .....	1	1	0
M. Quintal .....	10	10	0
Wm. Medeiros .....	1	1	0
J. B. Medeiros .....	1	1	0
M. Costa .....	1	1	0
M. F. Callistro .....	6	6	0
M. Robinson .....	1	1	0
S. Tsumoto .....	13	13	0
R. Kapena .....	3	3	0
H. Hickey .....	1	1	0
M. Kuwamura .....	7	7	0

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
Antone Joe .....	12	12	0
K. Sato .....	27	27	0
A. Pires .....	16	16	0
C. M. Cooke.....	7	7	0

The above list gives a total of 822 cattle tested out of which number 793 were passed and 29 condemned, branded and slaughtered.

### *Importations of Live Stock.*

S. S. Winber, San Francisco: 1 dog, W. F. X. Co.  
 S. S. Sachem, San Francisco: 2 dogs, T. V. King.  
 S. S. Wasco, San Francisco: 2 berkshire hogs, W. F. X. Co.;  
 1 ct. pigeons, Amer. Factors, Ltd.  
 S. S. Siberia Maru, Orient: 1 dog, W. M. Peterson; 1 dog,  
 M. Mathews.  
 S. S. Lurline, San Francisco: 1 dog, K. A. McGuire.

Respectfully submitted,

LEONARD N. CASE,  
 Assistant Territorial Veterinarian.

### REPORT FOR OCTOBER.

Honolulu, Hawaii, October 31, 1918.

Board of Commissioners of Agriculture and Forestry,  
 Honolulu, T. H.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of October, 1918.

#### FORAGE POISONING.

During the latter part of this month the Deputy Territorial Veterinarian for Maui reported that four mules had died in one of the plantation stables on that island, with symptoms of cerebro spinal meningitis. He also forwarded samples of corn stover which had been fed in the said stables and which had been grown at Haiku.

An examination of this corn stover showed both stalks and leaves to be heavily infested with mold fungi, and this undoubtedly must be considered the cause of the death of these mules.

Forage poisoning, caused by moldy corn, has been very prevalent throughout the United States this fall, practically all the states in the corn belt reporting heavy losses from the disease.

A number of articles on the subject have appeared in various veterinary magazines as well as in the special bulletins issued by a number of federal experiment stations. There is no treatment for the disease, the mortality being about ninety percent. The only remedy, therefore, is to see to it that no moldy corn is used for feed, at least for horses and mules; cattle are more resistant but are known to become affected when large quantities of infested corn are fed to them.

#### IMPORTATIONS OF LIVE STOCK.

There arrived during the month a shipment of 22 head of high class breeding stock, among which must be mentioned one of the best Hereford bulls in the United States, "Paragon Twelfth," which was consigned to the Parker Ranch.

Mr. Robert Hind of Puuwaawaa received 10 young Hereford bulls, all splendid animals.

For the Princeville Plantation and for Mr. G. N. Wilcox of Kauai, there were 2 Hereford bulls and 8 heifers, while the dairy at the Kamehameha School received a young Holstein bull.

All these cattle came from Kentucky, Wisconsin and Kansas, and had all been tuberculin tested. The animals for Kauai, were, however, the only ones accompanied by a certificate showing that they came from a state accredited tuberculosis free herd and were therefore allowed to proceed to their destination without further restrictions. The remaining animals, while all tuberculin tested, were not from such herds and were therefore retested before being reshipped.

#### TUBERCULOSIS CONTROL.

There were tested during the past month 622 head of cattle, of which number 21 reacted. Nine of these reacting belong to the Laie Plantation Company and six to Mr. W. E. Bellina. Of these latter six, five were imported animals and belonged to the same importation which made it necessary to alter the regulations so as to require certificates to the effect that the animals must come from clean herds or be retested immediately upon arrival. Eighteen of the twenty-one herds tested during the month were found to be free from tuberculosis.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, October 31, 1918.

Dr. Victor A. Nörsgaard, Chief, Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu, T. H.

SIR:—I have the honor to submit the following report for the  
month of October:

*Tuberculosis Control.*

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
Waimanalo Plantation ..	100	100	0
J. A. Vierra.....	2	2	0
A. L. C. Atkinson.....	40	40	0
T. Sumikawa .....	17	16	1
J. Faria .....	11	1	0
J. Alexander .....	2	2	0
J. B. Coholo.....	11	9	2
Fred Johnson .....	25	25	0
O. R. & L. Co.....	1	1	0
K. Kiyaba .....	7	7	0
Parker Ranch .....	1	1	0
Hind Rolph .....	10	10	0
Judge Paele .....	2	2	0
Alfred Roach .....	7	7	0
James Cullen .....	9	9	0
Frank Leialoha .....	1	1	0
L. L. McCandless.....	1	1	0
Laie Plantation Co.....	29	20	9
Kahuku Plantation Co...	18	18	0
Boys' Industrial School..	29	29	0
F. S. Lyman.....	58	57	1
Ben Mahi .....	21	21	0
Wm. Meyer .....	1	0	1
O. R. & L. Co.....	1	0	1
W. E. Bellina.....	228	222	6

From the above tabulated list it will be seen that a total of 622 cattle were tested, out of which number 601 were passed and 21 condemned and branded. Of the 21 condemned animals, 15 have been slaughtered and examined at local abattoirs and lesions of tuberculosis found in each case.

*Live Stock Importations.*

S. S. Ventura, San Francisco: 1 English bull dog.

S. S. Hyades, San Francisco: 2 Hereford bulls, 8 Hereford heifers, American Factors, Ltd.; 10 Hereford bulls, Hind



Rolph & Co.; 1 Hereford bull, Parker Ranch; 1 Holstein bull, Kamehameha Schools; 8 cts. poultry.

S. S. Sachem, San Francisco: 1 goat, J. H. McKeague.

S. S. Shinyo Maru, Orient: 1 ct. Japanese games, S. Sheba.

S. S. Wahkiakum, San Francisco: 3 dogs, Wells Fargo Express Co.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

## REPORT FOR NOVEMBER.

Honolulu, Hawaii, December 6, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of November, 1918.

### LIVE STOCK SANITARY LAWS.

Before proceeding with the revision of the rules and regulations pertaining to the control of diseases of animals within the Territory, it was deemed advisable to secure up to date data on this class of work in the various states and territories of the country.

The immense progress which recent years have witnessed in the perfection, application and manufacture of various kinds of serum and vaccine, and the amplification of preventive measures with a better knowledge of the nature and cause of nearly all transmissible diseases have caused a majority of the States to revise their live stock sanitary laws as well as to provide means for their enforcement.

A circular letter, enclosing a copy of our recently revised live stock importation rules, was therefore addressed to all State veterinarians or live stock sanitary boards, requesting copies of the laws, rules and regulations under which they are operating.

It is a pleasure to state that satisfactory replies were received promptly from all of them together with an amount of live stock sanitary literature which it has been difficult to peruse and classify.

As these various live stock sanitary statutes of the several States contain many valuable suggestions, some of which might to advantage be incorporated into our laws, we have found the time too short to formulate recommendations, but expect to have the same ready for the next meeting of the Board.

Very respectfully,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, December 5, 1918.

Doctor Victor A. Nörsgaard, Chief, Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu.

DEAR SIR:—I beg to submit the following report for the month of November:

*Tuberculosis Control.*

The work in this line has been confined to post-mortem examinations on cattle condemned for tuberculosis during the previous month and the compilation of data on tubercular tests made during the entire year.

Fourteen autopsies have been made during the month at various abattoirs and in all cases positive lesions of tuberculosis were found.

The testing of dairy herds in the City and County of Honolulu is practically finished for this year, and the data so far compiled shows a decided decrease in the amount of tuberculosis in said herds, in fact a decrease of about four (4) per cent.

With the enforcement of the new regulations covering the importations of cattle from abroad a still further decrease of tuberculosis among the herds here may be expected.

*Swine Plague.*

One small outbreak of swine plague was reported the latter part of the month, one animal having died. Autopsy revealed typical lesions of this disease. The remaining hogs were vaccinated at once. No further losses have been reported.

*Importation of Live Stock.*

The following livestock has been received at the port of Honolulu during the month:

S. S. Sachem, San Francisco: 2 dogs, W. F. X. Co.; 1 Hampshire hog, Harold Rice.

S. S. Harvard, Panama: 1 dog, Captain Foster.

S. S. Enterprise, San Francisco: 1 crate pigeons, Alexander & Baldwin; 2 crates rabbits, 1 crate poultry, W. F. X. Co.; 44 mules, Hawaiian Preserving Co.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

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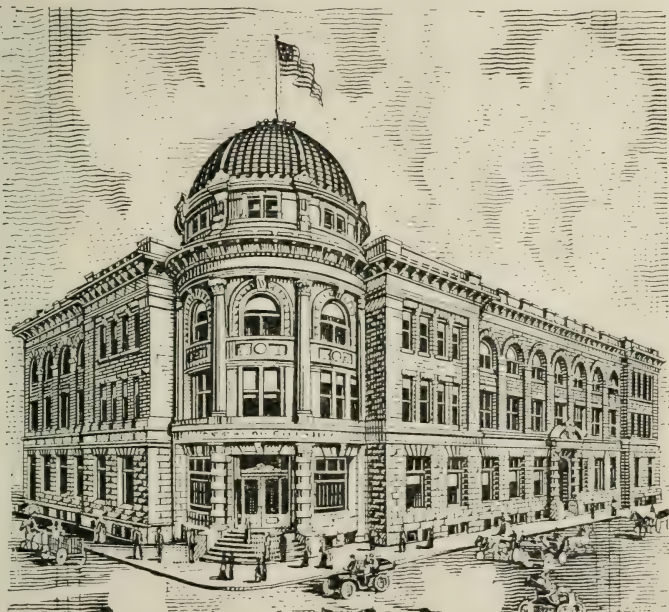
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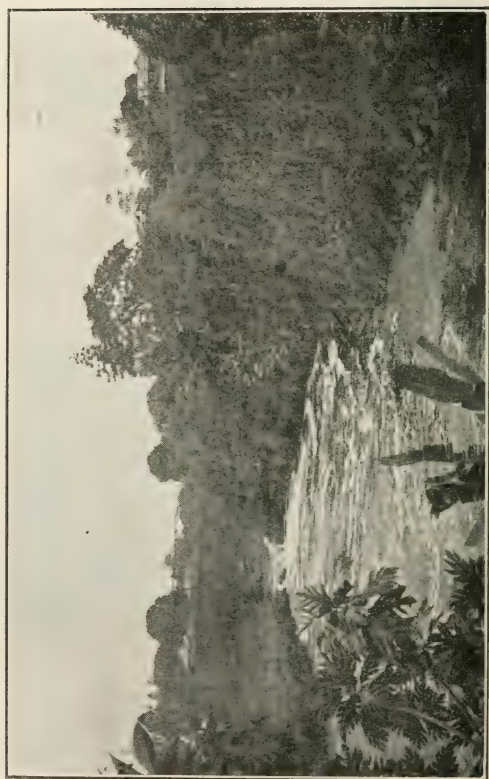
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

DECEMBER, 1918

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C. S. JUDD,  
Superintendent of Forestry.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

VOL. XV.

HONOLULU, DECEMBER, 1918.

No. 12

## New Forest Reserves

The work of examining and setting apart the general forest reserve system in the Territory of Hawaii was completed on December 31, 1918, when Governor C. J. McCarthy signed proclamations creating five new forest reserves and thereby adding 41,355 acres to the area of forested lands already reserved for protection as water conservers. At the same time a small area of deforested land, less than an acre, was eliminated in order to make a desirable exchange for a similar area of forested land.

These new reserves consisted of the Nonou in the Puna district, Kauai, embracing 818 acres of government land; the Puu Ka Pele, in Waimea, Kauai, 4900 acres of government land; the Mokuleia, in Waialua, Oahu, 6290 acres of government land; the Hauula, in Koolauloa, Oahu, consisting of 1143 acres of government land and 8050 acres of private land; an addition of 104 acres of government land to the existing Makua-Keaau Forest Reserve, in Waianae, Oahu; and the Olaa Forest Reserve, in Puna, Hawaii, consisting of 20,030 acres of government forest land. From Section C of the Olaa Forest Park Reserve, Olaa, Puna, Hawaii, 30,000 square feet of land without forest on it was eliminated for the exchange of an equal area bearing a heavy forest.

According to custom, the reports of the Superintendent of Forestry on these new projects, together with the official proclamations of the Governor, are printed herewith.

The new reserves bring the present total area of government forest lands, placed in the hands of the Board of Agriculture and Forestry for protection and administration, up to 554,842 acres, and the total area of all lands, including those privately owned, recommended to be treated in the same manner, up to 814,926 acres. Of this total area, 68 per cent belongs outright to the Territory.

The work of forestry in these Islands, however, does not consist merely in the setting aside of these reserves on paper by official proclamation. This demarcation is the essential first step in the beginning of forest protection and administration, but during the past few years it has gone hand in hand with actual

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protection work in the field. This will be seen to have been the case from the following facts:

From 1910 to date the Division of Forestry by its own efforts and through the coöperation of the Land Office by means of general leases adjacent to forest reserves constructed new stock-proof fences on 40.26 miles of forest reserve boundaries and repaired 17.85 miles of such existing fences, making a total boundary length of 58.11 miles impervious to stock. Through co-operation with local residents, hundreds of wild cattle, pigs and goats have been removed from the forest reserve lands.

A force of seven forest rangers are now on active duty on these reserves and patrol for forest fires and trespass of all kinds, repair old and build new fences, plant trees, and take general care of the forest lands in the reserves.

Tree planting by special gangs of tree planters is performed on open areas in the reserves, more particularly on watershed areas back of settlements, in order to conserve the water supply.

With the work of examining new lands for forest reserves now accomplished and out of the way, greater efforts will be made to complete the fencing that remains to be done and to extend the work of reforesting open areas in need of a forest cover.

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## Division of Forestry

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### NONOU FOREST RESERVE.

Honolulu, Hawaii, Oct. 15, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart as a forest reserve of portions of the government lands of Wailua and South Oloheua and portions of the acquired lands of North Oloheua and Waipouli, in the district of Puna, Island of Kauai, consisting of a total area of 818 acres, as shown on the attached blueprint map.

The area consists of a ridge called "Nonou," 1200 feet high, which runs approximately parallel to the coast and is from one to two miles inland from the shore line. This ridge begins at the Wailua River, where the river cuts through a gorge to the sea, near the northeast corner of the government land of Wailua, and runs north about two miles on to the lands of South and North Oloheua and Waipouli.

The area is bounded on the northwest by Lots 127 to 135 of the Kapaa Homesteads Second Series, on the southwest by the new Wailua Homesteads about to be given out, on the south by the Opaikaa Stream, Wailua River and government land, on the southeast by leased government land, and on the northeast

by privately-owned land, and consists of the following lands, all of which belong to the Territory of Hawaii:

Name of Land.	Acreage.
Waipouli and North Oloheua, Lease No. 737 to Makee Sugar Co., expires January 14, 1921.....	42
South Oloheua, Lease No. 737 to Makee Sugar Co., expires January 14, 1921.....	201
Wailua (Uka), unleased .....	214
Wailua (Kai), Lease No. 171 to E. Lindermann, expires July 1, 1921 .....	361
Total acreage .....	818

In the early days the whole ridge was undoubtedly covered with a heavy forest of koa, sandalwood, kukui, hala, and other indigenous trees which occupy similar situations, but the inroads made by cattle and fire have driven the forest back to the inaccessible parts of the ridge. On the landward side where the forest is still heavy, a small stream and several springs run down from the slopes, and these, it is needless to say, it is important to encourage and foster by forest protection. It is desirable also eventually to reforest the whole ridge, including the seaward side, because it lies directly across the path of the moisture-laden winds coming off the ocean and if the ridge is covered with forest once more the tendency will be to increase the precipitation.

The boundaries of this new reserve have been run so as to include only the steeper slopes and in such a manner that a minimum of fencing for its protection will be required.

For the reasons set forth above, I recommend that the Board approve the creation of this area as the Nonou Forest Reserve and that the Governor be requested to cause the land to be so set apart.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

PUU KA PELE FOREST RESERVE, KAUAI.

Honolulu, Hawaii, Oct. 16, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart as a forest reserve of a portion of the government land of Waimea, Island of Kauai, consisting of 4900 acres, as shown on the attached blueprint map.

This area is just south of the existing Na Pali-Kona Forest

Reserve, and consists topographically of two parts, an upland plateau from 3500 to 2000 feet in elevation running from the Puu Ka Pele Ridge westward, cut up by rather shallow gulches, and deep canyon country embracing the two main branches of the upper Waimea Canyon.

The upland plateau has since 1898 been fenced off and treated as a horse paddock, the country being very difficult to drive cattle in. As a consequence, young koa trees are coming up prolifically over a large part of the area and are supplementing the original heavy forest which is still found in the bottom of the gulches. The forest on this part of the new reserve is similar to that on the land to the north, already set aside, and well deserves protection. The boundary at the southeast end swings south so as to include additional land along the Puu Ka Pele ridge which is suitable for camp sites. The west end of this area is protected naturally by inaccessible valleys and cliffs and most of the south side is protected by a fence built in 1898 by the Estate of V. Knudsen, which holds General Lease No. 164 of this land, which expires on June 1, 1920.

The remaining portion of this new reserve consists of unleased government land. It includes the most scenic part of the Waimea Canyon by taking in the Waiahulu and Poomau Stream valleys. They consist of narrow streambeds from which the canyon walls rise precipitately, in many cases for several hundred feet sheer, while in the remainder of the two thousand or more feet to the top of the ridges the cliffs are hardly less steep. In many places the steep side ridges are sharply cut by erosion into pinnacles and castellated outposts, which, with the distant waterfalls and the variety of brilliant hues furnished by outcropping strata, the red volcanic soil, and the green vegetation, make the section one of very great scenic interest. It is eminently fitting that such an area be retained permanently under the control of the Territory and its delights made available to the public.

Wild goats in this section have in the past done much damage by destroying the scanty vegetation on the steep canyon sides and exposed ridges, thus allowing erosion to take place more rapidly, with the result that more debris continually falls into the valleys and the side gulches work back faster into the upland. If the goats are not kept down by hunting they will increase rapidly and work back farther into the forested regions. Government control over this area so as to allow unlimited goat hunting is desirable, therefore, and an additional reason why it should be included in the reserve.

In the past approximately 25 head of cattle and a few horses have grazed in the bottom of the canyon in this area, but it is believed that the damage which they have done to the vegetation and steep slopes by hastening erosion has been much greater than any benefit which has accrued from their being there.

For the above reasons, I recommend that the Board approve

the creation of the Puu Ka Pele Forest Reserve, and that the Governor be requested to cause the land to be so set apart.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## MOKULEIA FOREST RESERVE, OAHU.

Honolulu, Hawaii, Oct. 16, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart as a forest reserve of portions of the government lands of Kealia, Kawaihapai, Mokuleia and Kamananui, in the district of Waialua, Island of Oahu, consisting of 6290 acres, as shown on the attached blueprint map.

The entire area consists of unleased government land on the high north slope of the Waianae Mountains, starting from Kaala, the highest point on the island, and the United States Military Reservation of Waianae Uka on the east and the main ridge to the west as far as the Kuaokala Forest Reserve, and running northward down to the line of privately-owned grants at an elevation of approximately 1500 feet. This slope is cut up toward the lower end by very steep and precipitous valleys which become shallow as they near the top of the main range. As a rule, the valley bottoms are heavily covered with native trees such as the kukui, while on the ridges the native forest of koa, olopuia and lehua has receded, on account of the presence of stock which has unrestrainedly roamed over the lower part of the area in the past, until it is only toward the top of the main range that the heavy, undisturbed native forest is encountered.

The protection and extension of the forest on this whole area is one of importance and should be undertaken at once because the land drains naturally toward the lower agricultural section to the north and the cane, rice and banana crops which are grown there are partly dependent for irrigation on the twenty-one artesian wells sunk in this basin which depend upon the mountain slope for its supply of water. The seventeen pumping plants in this lower area attest the value attached to the water. In addition to these wells, there are four springs, the flow of which would be benefited by additional forest back on the mountain.

The lower line of this reserve has been located on the ground and marked with the usual pipes, and it is my plan to undertake, in coöperation with the owners or lessees of the adjacent lands, the construction of a fence on this line wherever it is needed to keep stock from getting on to the government land and, as opportunity affords, to reforest the present open areas with suitable trees.

On account of the importance of this area for water conser-



vation and the beneficial influence which it will exert on the flow of water at the lower levels below it, I recommend that the Board approve the creation of the Mokuleia Forest Reserve and that the Governor be requested to cause the land to be so set apart.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

### HAUULA FOREST RESERVE, OAHU.

Honolulu, Hawaii, Nov. 25, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart as a forest reserve of certain forest lands in Koolauloa, Oahu, being portions of the government land of Hauula and of the privately-owned lands of Makao, Kaluanui, Waiono, Makaua, Punaluu and Kahana, consisting of a total area of 9193 acres more or less, as shown on the attached blueprint map.

The boundary, starting on the Kaipapau-Hauula ridge, runs south approximately paralleling the coast at distances varying from one-fourth to two miles from the shore as far as the Kahana-Kaaawa Ridge, then runs mauka on this ridge over Puu Ohulehule, to the main Koolau Range, thence northerly to and down the Kaipapau-Hauula Ridge and in general follows the edge of the heavy forest on the seaward side.

The area includes land which supports a "water-bearing forest" composed of the usual native trees such as koa, ohia, kukui, hala, hau and their plant associates of ferns, vines and undergrowth which combine to make up the ideal ground cover for conserving the water run-off. This forest in general is in a very healthy condition with very few dead trees.

Many industries are dependent on the water emanating from this forest, viz.: the sugar cane in Lower Kaluanui, Punaluu and Kahana valleys, the rice in Punaluu Valley, and from the headwaters of the main Kahana Stream, at an elevation of about 750 feet, water is taken by tunnel south along the mountain, then through the main Waiahole tunnel to far distant cane fields in the upper Ewa basin. The importance of protecting and maintaining the forest on this area for the conservation of water is therefore apparent.

While of the total area of 9193 acres, shown on the following list, only 1143 acres, or a little over 12.4 per cent (the land of Hauula), belongs to the government, the owners of the other large portions have been consulted and have raised no objection to their land being included in the recommended reserve.

Name of Land.	Owner.	Acreage.
Hauula .....	Territory of Hawaii.....	1,143
Makao .....	Estate of M. V. Carter.....	24
Kaluanui .....	Bishop Estate .....	1,033
Waiono, Gr. 3025...	Laie Plantation .....	47
Makaua, Gr. 1306:2..	Ben Kaoao .....	48
Punaluu .....	Bishop Estate .....	2,950
L.C.A.'s in Punaluu..	Various owners .....	28
Kahana .....	Mary E. Foster.....	3,920
Total Area .....		9,193

On the lower boundary across the government land of Hauula, which is cut up by six narrow valleys, the Hauula homesteaders have recently completed the construction of a fence which now keeps their cattle from getting into the forest. The building of this fence was done under an arrangement made with the homesteaders by the Land Commissioner in 1913, but it was only by my personal efforts in keeping after them and assisting by furnishing durable wire and a few posts that the project was finally accomplished.

No cattle are at large near the forest boundary where it crosses other lands, so that at present no additional fencing is necessary.

In Kaluanui, Punaluu and Kahana, pineapples have been raised in the past near the forest boundary, but cultivation of this crop here has recently been given up.

This reserve includes Kaliuwaa, commonly called "The Sacred Valley," which is famous in Hawaiian legendary history, and is a unique picturesque valley with precipitous walls, much visited by the venturesome lover of nature.

For the reasons above set forth, I recommend that the Board approve the project of creating the Hauula Forest Reserve, as described above, and that the Governor be requested to take the necessary steps toward this end.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

ADDITION TO MAKUA-KEAAU FOREST RESERVE,  
OAHU.

Honolulu, Hawaii, June 3, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart, as an addition to the present Makua-Keaau Forest Reserve, of an area of 103.85 acres adjacent to the above reserve

at the head of Makua Valley, district of Waianae, Oahu. The land all belongs to the Territory and is not now under lease.

When the Makua-Keaau Forest Reserve was set apart by proclamation of the Governor on June 4, 1913, it was evidently intended by my predecessor to include in the reserve the area under discussion, but for some reason or other the official line was put further mauka. What this was, I have not been able to ascertain, and there seems to be no good reason why this area of 103.85 acres should not now be added to the reserve, and this plan meets with the approval of the Acting Land Commissioner.

The land is situated at the upper end of the bottom of Makua Valley. It is dissected by the main valley stream-bed and several lateral gulches, all of which are filled with kukui trees. The ridges for the most part, while clothed no doubt with a heavy native forest in the early days, are now covered with grass, guava and lantana, and in places have been badly eroded as the result of overgrazing. Up to the present time there has been no barrier to prevent cattle from wandering up from the leased land makai on to this area, a condition which it is most advisable to stop at the earliest possible date. With this area properly protected from grazing and with the aid of a little artificial reforestation it can be made of much greater value than it is at present by the restoration of forest conditions for the protection of local sources of water. Every drop of fresh water in this region is at a premium during the dry season, and this condition will be even more so in the future when the lands adjacent to and makai of this area are homesteaded.

For this reason it seems logical to me that everything possible should now be done to make the sources of water supply in this valley more dependable, and in order to make a start toward this end, I do now recommend that the Board approve the project of setting apart the area of 103.85 acres of government land at the head of Makua Valley, as shown on the attached map, as an addition to the present Makua-Keaau Forest Reserve, in the district of Waianae, Oahu, and that the Governor be requested to take the necessary steps toward this end.

While I am on this subject I consider it my duty to call once more to your attention the unfulfilled fencing requirement in this region and to make the following recommendation in the effort to secure the construction of this fence, which is necessary for the protection of the native forest in the Makua-Keaau Forest Reserve.

When General Lease No. 730 of "all of the Government remnants of the lands of Makua, Kahanaiki and the Government interest in Keawaula, Waianae, Oahu," amounting to 1914 acres, was advertised for sale, the notice which appeared in the Pacific Commercial Advertiser of January 22, 1910, contained the following sentence: "This lease will contain conditions requiring fencing of all boundaries of forest reserve." The lease was sold on February 21, 1910, to Mr. L. L. McCandless for the annual



rental of \$451 and runs for ten years from that date, or until February 21, 1920. The lease contains the usual clause providing for the withdrawal of any part or parts of the land demised for homestead, settlement, reclamation, forestry and other purposes, and also the following special fencing clause:

"The Lessee shall construct at his own expense within one year from Proclamation of Forest Reserve, a lawful fence as defined by Section 407, Revised Laws of Hawaii, along the entire boundaries of the land, herein demised, and adjoining the Forest Reserve, and maintain said fence in good repair during the term of this lease."

The Makua-Keaau Forest Reserve, which contains parts of the above lands, was set apart by proclamation on June 4, 1913. The holder of Lease No. 730, therefore, had until June 4, 1914, for the construction of the fence, approximately five and a half miles in length, wherever the leased land is adjacent to the Makua-Keaau Forest Reserve. This, to date, he has not done, neither did he build the fence around the Kuaokala Forest Reserve which was required by General Lease No. 739, which he held and which expired on January 1, 1916, and on the land of which he is still allowed by the Land Office to run cattle as a tenant at will.

Soon after June 4, 1914, my predecessor began to urge the then Land Commissioner to require the holder of Lease No. 730 to build this fence and continued his urgings until he resigned, when I took up the cudgel and have urged the present Land Commissioner every few months to enforce this requirement of the lease. All of these efforts have met with no success to date, and I now wish to force the issue.

Mr. McCandless was fully informed of this fencing requirement before he bid on the lease by the sentence in the published notice of sale of the lease, quoted above, and signed the lease with this fencing clause plainly written into it. I, therefore, cannot see how he can have any excuse for not building the fence, neither can I comprehend why the Land Commissioner has not required compliance with this fencing clause, the disregardance of which is sufficient cause for the cancellation of the lease. By not enforcing it, an injustice is done to holders of other leases who have complied with similar fencing clauses.

The fence should have been built four years ago, and, unless prompt action is taken now, the lease will expire as did the Kuaokala Lease without the fencing requirement being fulfilled.

The fence is absolutely necessary for the protection of the native forest in the forest reserve, which is now being damaged by the cattle which wander at will into it from the adjacent leased land.

I, therefore, have the honor to recommend that in order to expedite matters, a resolution along the following or similar lines be adopted by the Board and that copies be forwarded to the



Commissioner of Public Lands, the Attorney General, and the Governor of Hawaii:

"Whereas, General Lease No. 730 of the government lands of Makua, Kahanaiki and the government interest in Keawaula, Waianae, Oahu, sold on February 21, 1910, to Mr. L. L. McCandless, required the lessee to build a lawful fence along the boundary of the leased land adjacent to the Makua-Keaau Forest Reserve, which fence, by the requirement in the lease, was to have been completed by June 4, 1914;

"Whereas, Over four years have now expired and the fence has not yet been built;

"Whereas, Said fence is necessary and essential for the protection of the native forest in the adjacent forest reserve as a barrier against the cattle which now wander at will from said leased land into said forest reserve with disastrous results;

"Be it Resolved, That the Board of Commissioners of Agriculture and Forestry places itself on record as being strongly opposed to this non-compliance with this fencing requirement and hereby recommends that every necessary step be taken by the Commissioner of Public Lands to force the holder of General Lease No. 730 to fulfill this requirement forthwith."

Respectfully yours,

C. S. JUDD,  
Superintendent of Forestry.

#### OLAA FOREST RESERVE.

Honolulu, Hawaii, Nov. 26, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I have the honor to recommend the setting apart as a forest reserve of a portion of the government land of Olaa, Puna, Hawaii, consisting of 20,030 acres, more or less, as shown on the attached blueprint map.

The whole area is covered with a heavy forest of native trees such as the ohia, olapa, koa, loulou palm and tree ferns with their accompaniment of a heavy undergrowth of ferns and vines and is situated between the Upper Waiakea Forest Reserve on the north, the Upper Olaa Forest Reserve on the west, and Section A of the Olaa Forest Park Reserve and homestead lots on the south. It includes a vast wilderness of heavy forest, situated between the elevations of 1700 and 3800 feet, which is impenetrable except for the roads and trails which have been cut through it.

Over fifteen years ago the tract was surveyed into homestead lots with the idea that they would be settled upon by coffee planters. Coffee cultivation was a failure here owing to the

shallowness of the soil and other unfavorable factors, and although homesteads have repeatedly been taken up in this region and a lot of money spent in improving them, no one has been successful in raising any crops.

With this demonstration in view, and with the idea of making some use of the land, four leases have been made during the past two years by the Land Office of a part of the land at the lower or makai end, consisting of a total of 8886 acres, at nominal rentals, with the idea that cattle could be raised on the land. All of these leases are held by Japanese, who are about the only people who will live in this wet region. In connection with one of these leases, the largest, consisting of 8589 acres, portions of the land have been subleased to four other Japanese. These men are making an unsuccessful attempt at raising a few head of scrubby cattle in the forest. At the time the first lease was assigned to a second party in April, 1918, 175 head of cattle were supposed to have been turned over with the lease, but on account of the heavy growth of forest the assignees have been able to find only 100 head.

Recently an application was made for a lease of the balance of this forest land for grazing purposes, but at my request the application has been held up. If further extended grazing is permitted on the land it will, in time, become similar to adjacent lands makai—a useless waste of dead trees, fallen logs and Hilo grass. Such a large stretch of forest cannot help but exert a favorable influence on the surrounding climate, and this is of importance to the Olaa Sugar Plantation just below, which suffered from the effects of drought two summers ago.

As stated above, the soil throughout the region for the most part is shallow and is best suited to forest growth. Continued grazing in the region on any scale will in time reduce the forest to a useless waste.

Sufficient land has been left out of the area recommended to be set aside to provide for the need of additional homesteads at the makai or lower end where soil conditions are more favorable, and a sufficient area at the high elevation near the upper end, not far from the Volcano House, has been reserved for additional summer lots.

For the reasons above set forth, I recommend that the Board approve the project of creating the Olaa Forest Reserve, as described above, and that the Governor be requested to take the necessary steps toward this end.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## WITHDRAWAL OF LAND FROM OLAA FOREST PARK RESERVE.

Honolulu, Hawaii, Nov. 27, 1918.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN :—I have the honor to submit, as follows, a report recommending the withdrawal of 30,000 square feet or 0.69 acre of land from a part of Section C of the Olaa Forest Park Reserve on the Volcano Road above Glenwood, in Olaa, Puna, Hawaii, for the purpose of exchange with Mr. F. G. Snow for an equal area of privately owned forest land in the immediate vicinity which it is desired to include in the above reserve. The two areas, each 200 feet by 150 feet in size, are shown on the attached maps.

This section of the Olaa Forest Park Reserve, which was set aside on August 20, 1914, consists of narrow strips of land, only 150 feet deep, fronting on both sides of the Volcano Road. On some of the homestead lots these reserve strips occupy most of the frontage and in some cases have caused great inconvenience.

In this case, the piece desired by Mr. Snow is opposite his frontage area across the road, and he desires to use it as a driveway between his two opposite lots. There is only a scant covering of dying tree ferns and dead ohia trees on this piece, whereas on the piece of equal size which he desires to give the government in exchange, and which is already protected by a fence, there is a heavy forest of ohia and tree ferns in good condition.

The government will thus benefit by the exchange and, for this reason, I recommend that the Board approve the withdrawal of the 30,000 square feet and that the Governor be requested to take the necessary further action to perfect the exchange.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## Recreation in the National Forests

How the U. S. Forest Service on the mainland caters to the recreational needs of the public and how the public respects the camping privileges may be seen in the following news item issued by the Portland, Oregon, Forest Service Office concerning the Eagle Creek Camp Grounds on the famous new Columbia Highway in the Oregon National Forest.

While most of the lands in the Hawaiian forest reserves are not susceptible of such a use because of the fact that they are covered with forests which must be absolutely protected from damage by man and beast for the conservation of water, there are a few areas in the non-water-bearing regions where similar camping privileges could be granted with safety were the areas accessible by passable roads.

The news item is as follows:

"Seventeen thousand, four hundred fifty-seven visitors registered at Eagle Creek Camp Grounds, on the Oregon National Forest, between April 15 and November 15, 1918, according to a report received by Forest Supervisor T. H. Sherrard from Ranger Wiesendanger. This is about four hundred less than registered during the summer of 1917. Since about one visitor in five registers, the total attendance at the camp-grounds for the past season was about eighty-five thousand.

"Every state in the union was represented among the visitors registered during the season. People also registered from eight provinces of Canada, from Mexico, and nine other foreign countries.

"The Sunday night preceding Labor Day three hundred cars were parked at the camp grounds overnight, and just after noon on Labor Day six hundred fifteen cars were counted in the park. The crowd on the grounds at this time was estimated at thirty-five hundred.

"The extensive use of these grounds by the public made it necessary to open up new camping sites on the west side of Eagle Creek, and one-half mile of new trail was constructed leading to these sites. Water has also been piped to this side of the creek.

"During the present season a ranger station in keeping with the surroundings has been constructed on the camp grounds from plans donated by Architect A. E. Doyle of Portland. The parking place and loop road have been macadamized, and sixteen new camp stoves constructed at convenient camping spots. There were no serious accidents reported as having occurred in the park or along the Eagle Creek trail.

"All the picnic tables used on the grounds have been taken down and placed in the storehouse for winter. None of them had been defaced or injured more than by natural wear and tear, in spite of the almost constant use they received during the season. The Forest Service plans to add fifty new tables to the equipment next year.

"The public has furnished splendid coöperation during the present season, both in keeping campsites clean and putting out campfires before leaving. During the season, sixteen parties were requested by the ranger in charge to come back and clean up their campsites and put out the fires which they had left.

"The last month a gasoline drag saw has been in use cutting up a large number of dead snags on the camp grounds to provide



firewood for the use of campers next year. This wood was placed at convenient intervals where it is readily accessible from the various campsites on the grounds.

"During the huckleberry season many of the visitors at Eagle Creek Camp Grounds climbed the Wauna Point trail—which leaves the Columbia River Highway near Eagle Creek—for the purpose of gathering berries. The register kept at the head of Wauna Point trail shows that over one hundred eighty-five campers climbed to the point."

C. S. J.

## By Authority

### FOREST RESERVE HEARING.

Notice is hereby given that under the provisions of Chapter 37, R. L. H. 1915, a public hearing will be held by the Governor of Hawaii and the Board of Commissioners of Agriculture and Forestry on Tuesday, the 31st day of December, 1918, at 10 o'clock a. m., in the office of said Board at the Government Nursery, King Street, Honolulu, to consider the defining of the limits and the setting apart as forest reserves of portions of certain government and other lands, more particularly as follows:

1. Island of Kauai, District of Puna, Lands of Wailua, North and South Oloheua and Waipouli (Nonou); area 818 acres.

2. Island of Kauai, District of Waimea (Puu Ka Pele); area 4900 acres.

3. Island of Oahu, District of Waialua, Lands of Kealia, Kawaiha-pai, Mokuleia and Kamananui (Mokuleia); area 6290 acres.

4. Island of Oahu, District of Koolauloa, Lands of Hauula, Makao, Kaluanui, Waiono, Makaua, Punaluu and Kahana (Hauula); area 9193 acres.

5. Island of Oahu, District of Waianae, Land of Makua (addition to Makua-Keauu Forest Reserve); area 103.85 acres.

6. Island of Hawaii, District of Puna, Land of Olaa (Olaa), area 20,030 acres; and to consider the withdrawal from Section C of the existing Olaa Forest Park Reserve, Olaa, District of Puna, Island of Hawaii, of 30,000 square feet of land.

Maps and descriptions of the said lands are on file in the office of the Superintendent of Forestry, where they are open to the inspection of the public. At the said time and place all persons who so desire will be given full opportunity to be heard upon the subject matter of this notice and to present evidence and arguments in person, by proxy, or by letter, either for or against the setting apart of said lands as forest reserves or the elimination of said land from the existing reserve.

C. J. McCARTHY,

Governor of Hawaii.

The Capitol, Honolulu, T. H., December 10th, 1918.

### PROCLAMATION OF FOREST RESERVE IN THE DISTRICT OF PUNA, ISLAND AND COUNTY OF KAUAI, TERRITORY OF HAWAII.

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, C. J. McCARTHY, Governor of

Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby set apart as a forest reserve to be called the NONOU FOREST RESERVE, subject to existing rights, portions of the government lands of Wailua and South Olohehena and portions of the acquired lands of North Olohehena and Waipouli in the District of Puna, Island and County of Kauai, Territory of Hawaii, containing an area of 818 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2591 and "Nonou Forest Reserve" and a description accompanying the same numbered C. S. F. 2870, which said description now on file in said Survey Department is as follows:

NONOU FOREST RESERVE, PUNA, KAUAI,

Including portions of the Government Lands of Wailua and South Olohehena, and portions of the acquired Lands of North Olohehena and Waipouli.

C. S. F. 2870.

Beginning at a 1½-inch galvanized iron pipe on the East boundary of this Reserve and on the North boundary of the land of Wailua, from which "Haleilio," marked by a + on rock is by true azimuth and distance 123° 27' 693.0 feet, the coördinates of said point of beginning referred to Government Survey Trig. Station "Nonou" being 502.9 feet North and 2889.0 feet East, as shown on Government Survey Registered Map No. 2591, and running by true azimuths:

1. 72° 19' 1610.1 feet within the land of Wailua to a Forest Reserve Monument;
2. 341° 31' 1819.7 feet within the land of Wailua to a Forest Reserve Monument;
3. 26° 51' 815.2 feet within the land of Wailua to a Forest Reserve Monument;
4. 43° 29' 2369.7 feet within the land of Wailua to a Forest Reserve Monument;
5. 328° 11' 828.7 feet within the land of Wailua to a Forest Reserve Monument;
6. Thence along top edge of the pali on the South side of Opaekaa Stream, the direct azimuth and distance being: 75° 11' 2373.4 feet;
7. 131° 58' 938.4 feet within the land of Wailua to a Forest Reserve Monument;
8. 168° 44' 1433.8 feet within the land of Wailua to a Forest Reserve Monument;
9. 133° 45' 1795.7 feet within the land of Wailua to a Forest Reserve Monument;
10. 224° 35' 3829.4 feet within the land of Wailua to a Forest Reserve Monument at the Southeast corner of Lot 135, Kapaa Homesteads, 2nd Series, on the North boundary of Wailua;
11. 191° 06' 1125.6 feet along Lots 135 and 134, Kapaa Homesteads, 2nd Series, within the land of South Olohehena, to a + on stone;
12. 207° 53' 1235.4 feet along Lots 133 and 132, Kapaa Homesteads, 2nd Series, within the land of South Olohehena, to a + on stone;
13. 181° 29' 961.5 feet along Lots 131 and 130, Kapaa Homesteads, 2nd Series, within the land of South Olohehena and North Olohehena, to a + on large rock;

14. 226° 30' 1007.0 feet along Lot 129, Kapaa Homesteads, 2nd Series, within the land of North Oloheua, to a + on stone;
15. 226° 10' 310.0 feet along Lot 128, Kapaa Homesteads, 2nd Series, within the land of North Oloheua, to a + on stone;
16. 217° 07' 477.5 feet along Lot 128, Kapaa Homesteads, 2nd Series, within the land of North Oloheua, to a pipe;
17. 245° 29' 581.0 feet along Lot 127, Kapaa Homesteads, 2nd Series, within the land of Waipouli, to a + on stone;
18. 353° 25' 1668.1 feet within the land of Waipouli and North Oloheua to the North boundary of South Oloheua.
19. 331° 06' 3428.7 feet along Grant 5264 to R. P. Spalding within the land of South Oloheua;
20. 30° 29' 72.5 feet within the land of South Oloheua to point of beginning.

Area, 818 acres.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

(Seal.) DONE at the Capitol in Honolulu this 31st day of December, A. D. 1918.

C. J. McCARTHY,  
Governor of Hawaii.

By the Governor:  
CURTIS P. IAUKEA,  
Secretary of Hawaii.

#### PROCLAMATION OF FOREST RESERVE, DISTRICT OF WAIMEA, ISLAND AND COUNTY OF KAUAI, TERRITORY OF HAWAII.

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, C. J. McCARTHY, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby set apart as a forest reserve to be called the PUU KA PELE FOREST RESERVE, subject to existing rights, a portion of the government land of Waimea in the District of Waimea, Island and County of Kauai, Territory of Hawaii, containing an area of 4900 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2602 and "Puu Ka Pele Forest Reserve" and a description accompanying the same numbered C. S. F. 2990, which said description now on file in said Survey Department is as follows:

PUU KA PELE FOREST RESERVE, WAIMEA, KAUAI.

C. S. F. 2990.

Beginning at Kahililoa Peak, the true azimuth and distance to Government Survey Trig. Station "Puu Ka Pele" being 69° 38' 10" 8266 feet, as shown on Government Survey Registered Map No. 2602, and running as follows:

1. In a westerly direction to the junction of the Poomau and Waiahulu Streams;

2. Thence in a southwesterly direction up the cliffs to a Forest Reserve Monument, on the main Waimea Canyon Ridge, the true azimuth and distance from said monument to Government Survey Trig. Station "Puu Ka Pele" being: 163° 16' 30", 2778.4 feet;
3. Thence 68° 39' (True) 1548.2 feet to a Forest Reserve Monument on the ridge between Nohomalu and Kaanamahuna Valleys;
4. Thence 125° 39' (True) 3209.3 feet crossing Kaanamahuna and Kaulanamaulu Valleys, to a ¾-inch galvanized iron pipe on Mana Ridge;
5. Thence 171° 58' (True) 1661.8 feet to a Forest Reserve Monument at the Puu Ka Pele fence on Lapa Ridge, the true azimuth and distance from said monument to Government Survey Trig. Station "Puu Ka Pele" being: 274° 46' 30", 3495.5 feet;
6. Thence down along the Puu Ka Pele fence on Lapa Ridge, in a Westerly direction, approximately 13,750 feet, to a point on said fence, at the edge of the pali at Kepapa Spring;
7. Thence in a Northerly direction across Haeleele, Polihale and Kaa-weiki Ridges, approximately 10,750 feet to the end of the Kauhao fence at the pali, adjoining the NA PALI-KONA FOREST RESERVE;
8. Thence in an Easterly direction, along the NA PALI-KONA FOREST RESERVE, following up along the Kauhao fence, approximately 11,160 feet, to a point on the Waimea Canyon Ridge called "Puu Hinahina," as shown on Government Survey Registered Map Nos. 2246 and 2375;
9. Thence still along the NA PALI-KONA FOREST RESERVE, in an Easterly direction to the junction of the Halemanu and Nawaimaka Valleys;
10. Thence along same in a Southeasterly direction to the head of the Waipoo Falls;
11. Thence along same in a Southeasterly direction to a point known as Kaou on the Kumuwela Ridge, the true azimuth and distance from said point (Kaou) to Government Survey Trig. Station "Puu Ka Pele" being: 23° 11' 10", 8665.1 feet;
12. Thence along same in an Easterly direction to the Awini Falls;
13. Thence along same in a Southerly direction to the point of beginning.

Area, 4900 acres, more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

(Seal.) DONE at the Capitol in Honolulu, this 31st day of December, A. D. 1918.

C. J. McCARTHY,  
Governor of Hawaii.

By the Governor:  
CURTIS P. IAUKEA,  
Secretary of Hawaii.

# **PROCLAMATION OF FOREST RESERVE IN THE DISTRICT OF WAIALUA, CITY AND COUNTY OF HONOLULU, ISLAND OF OAHU, TERRITORY OF HAWAII.**

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, C. J. McCARTHY, Governor of



Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby set apart as a forest reserve to be called the MOKULEIA FOREST RESERVE, subject to existing rights, portions of the government lands of Kealia, Kawaihapai, Mokuleia, and Kamananui, in the District of Waialua, City and County of Honolulu, Island of Oahu, Territory of Hawaii, containing an area of 6290 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 1533 and "Mokuleia Forest Reserve" and a description accompanying the same numbered C. S. F. 2642, which said description now on file in said Survey Department is as follows:

### MOKULEIA FOREST RESERVE,

Including portions of the Lands of Kealia, Kawaihapai, Mokuleia and Kamananui, Waialua, Oahu.

C. S. F. 2642.

Beginning at Government Survey Trig. Station "Hakakoa" at an angle in the boundary of this reserve and the KUAOKALA FOREST RESERVE, said point being by true azimuth and distance  $59^{\circ} 55' 30''$  17,676.6 feet from Government Survey Trig. Station "Mokuleia," as shown on Government Survey Registered Map No. 1533, and running by true azimuths:

1.  $169^{\circ} 50'$  61.0 feet along the KUAOKALA FOREST RESERVE to a forest reserve monument;
2.  $284^{\circ} 36'$  19,433.0 feet along the upper boundary of the Mokuleia Grants to the Northwest corner of Lot 2, of Grant 1976, to Haalilo, to a forest reserve monument;
3.  $22^{\circ} 36'$  2,409.0 feet along Lot 2, of Grant 1976, to Haalilo, to a forest reserve monument;
4.  $270^{\circ} 57'$  2,414.0 feet along same;
5.  $171^{\circ} 06'$  1,980.0 feet along same;
6.  $284^{\circ} 36'$  8,864.0 feet along the upper boundary of the Kamananui Grants to a forest reserve monument at the Southeast corner of Grant 1642, to Kahui;
7.  $14^{\circ} 36'$  570.0 feet along Grant 1782, to Pekelo;
8.  $284^{\circ} 36'$  2,718.0 feet along Grants 1782 and 1788;
9.  $328^{\circ} 20'$  6,023.0 feet along Grants 1799 and 1789, to a pipe monument on the summit of Puu Pane (Puu Koa);
10. Thence up the ridge along the U. S. Military Reservation (Waianae-uka), to a pipe monument on the summit of Kamaohanui Peak, the direct azimuth and distance being:  $76^{\circ} 55' 44''$  7095.1 feet;
11. Thence still up the ridge along the U. S. Military Reservation (Waianae-uka) to the junction of the boundaries of the lands of Waianae-uka, Waianae-kai, and Makaha, on Mount Kaala, the direct azimuth and distance being approximately  $73^{\circ} 40'$  5370.0 feet;
12. Thence along the divide of the Waianae Range to the junction of the boundaries of the lands of Makaha and Makua, the direct azimuth and distance being approximately:  $117^{\circ} 10'$  9600.0 feet;
13. Thence still along the divide of the Waianae Range to the junction of the boundaries of the lands of Mokuleia and Kawaihapai, the direct azimuth and distance being approximately:  $136^{\circ} 15'$  10,870.0 feet;

14. Thence still along the divide of the Waianae Range to the Southeast angle of the KUAOKALA FOREST RESERVE on the land of Kaena, the direct azimuth and distance being approximately: 111° 00' 7070.0 feet;
15. 207° 49' 1,348.4 feet along the KUAOKALA FOREST RESERVE;
16. 173° 00' 900.0 feet along the KUAOKALA FOREST RESERVE to the point of beginning.

Area, 6290 acres; consisting entirely of Government land.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

(Seal) DONE at the Capitol in Honolulu, this 31st day of December, A. D. 1918.

By the Governor:

CURTIS P. IAUKEA,  
Governor of Hawaii.

**PROCLAMATION OF FOREST RESERVE IN THE DISTRICT OF  
KOOLAULOA, CITY AND COUNTY OF HONOLULU,  
ISLAND OF OAHU, TERRITORY OF HAWAII.**

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, C. J. McCARTHY, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby recommend and approve as a forest reserve to be called the HAUULA FOREST RESERVE, portions of the government and privately-owned lands of Hauula, Makao, Kaluanui, Waiono, Makaua, Punaluu, and Kahana, in the District of Koolauloa, City and County of Honolulu, Island of Oahu, Territory of Hawaii, containing an area of 9193 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department, marked Government Survey Reg. Maps Nos. 114, 311, 1500 and 2220, and "Hauula Forest Reserve," and a description accompanying the same, numbered C. S. F. 2994, which said description now on file in said Survey Department is as follows:

**HAUULA FOREST RESERVE,**

Including portions of the Lands of Hauula, Makao, Kaluanui, Waiono, Makaua, Punaluu and Kahana, Koolauloa, Oahu.

C. S. F. 2994.

Beginning at an iron pin at the North corner of this reserve on the ridge between the lands of Kaipapau and Hauula, the coördinates of said point of beginning referred to Government Survey Trig. Station "Kaipapau" being 4653.5 feet South and 988.0 feet West, as shown on Government Survey Registered Maps Nos. 114, 311, 1500 and 2220, and running by true azimuths:

1. 305° 26' 465.0 feet across gulch to a galvanized spike on top of ridge;
2. 290° 49' 979.0 feet across gulch to an iron pin on top of ridge;
3. 315° 55' 379.0 feet down slope to a galvanized spike at bottom of gulch, on the Northwest side of the stream bed;

4. 245° 33' 290.7 feet across stream to a galvanized spike on slope;
5. 287° 32' 114.6 feet up slope to an iron pin on brow of ridge;
6. 308° 12' 1369.4 feet across gulch to an iron pin on top of ridge near a large boulder;
7. 301° 56' 778.7 feet across gulch to an iron pin on top of ridge;
8. 302° 15' 918.8 feet across gulch to a galvanized spike on top of ridge, on the boundary between the lands of Makao and Hauula;
9. Thence Southeasterly along top of ridge, along the land of Makao, the direct azimuth and distance being: 34° 25' 1790 feet, more or less;
10. 310° 00' 830.0 feet, more or less, across gulch to Waiahilahila peak at the head of the land of Kapaka;
11. 344° 40' 2554.0 feet to prominent point on spur from main ridge, on West side of river;
12. 290° 27' 1018.0 feet down ridge and across stream;
13. 295° 40' 786.0 feet across a sharp rocky ridge, and to a prominent rocky peak on next ridge;
14. 277° 50' 350.0 feet down ridge and across small valley;
15. 230° 15' 458.0 feet crossing foot of spur;
16. 301° 15' 272.0 feet up slope;
17. 232° 10' 168.0 feet across swale between ridge;
18. 183° 38' 159.0 feet across same;
19. 156° 35' 174.0 feet down ridge;
20. 232° 00' 1240.0 feet to high conspicuous peak (on Kaluannui);
21. 322° 20' 1280.0 feet to sharp peak on boundary of land of Papaakoko;
22. 33° 15' 535.0 feet up along ridge, along land of Papaakoko;
23. 43° 10' 795.0 feet along top of ridge to a 1¼-inch pipe, known as Papa Trig. Station (E. D. Baldwin);
24. 11° 45' 5099.4 feet across the lands of Waiono, Makaua and Punaluu, to an iron pin;
25. 285° 18' 30" 2989.0 feet across land of Punaluu to ditch intake;
26. 300° 45' 3000.0 feet, more or less, up side of steep mountain, to a very conspicuous peak called "Piei Peak";
27. 340° 43' 3136.0 feet down slope and across small gulches to a 1¼-inch pipe on small ridge;
28. 15° 20' 30" 2629.0 feet across small gulches to a ½-inch pipe, on small ridge East of a Hau grove;
29. 31° 43' 3829.0 feet across small gulches to a 1¼-inch pipe, near the top of a prominent grassy hill;
30. 312° 46' 30" 2589.0 feet across valley and stream to a 1¼-inch pipe on small knoll;
31. 225° 06' 2430.0 feet down slope and across small valley to a 1-inch iron bolt on edge of flat;
32. 352° 18' 2470.3 feet up along the Western side of flat, to a 1¼-inch pipe at end of said flat;
33. Thence down along the Southeastern edge of said flat to a 1¼-inch pipe, the direct azimuth and distance being: 200° 10' 30" 1936 feet;
34. Thence down along the Eastern edge of said flat to a 1¼-inch pipe, the direct azimuth and distance being: 157° 13' 30" 828.0 feet;
35. 225° 26' 1697.7 feet across small valley and Kawa Stream, to a 1¼-inch pipe on prominent ridge;
36. 191° 00' 2286.5 feet across gulch to a 1¼-inch pipe on prominent ridge, East of a stream crossing;
37. 221° 30' 30" 5676.0 feet across several small gulches to a ½-inch pipe, on a small ridge East of Huilua Fishpond;

38. Thence up and along middle of small ridge to a point in the middle of the Kahana-Kaaawa ridge, the direct azimuth and distance being: 301° 58' 1536 feet;
- Thence Southerly along the middle of the Kahana-Kaaawa ridge on the following direct azimuths and distances:
39. 17° 17' 1837.4 feet to a sharp peak;
40. 30° 40' 3475.0 feet to a peak;
41. 357° 30' 4580.0 feet to a sharp peak called "Manamana";
42. 13° 25' 4120.0 feet to the junction of the lands of Kahana-Kaaawa and Hakipuu;
43. Thence along the middle of the Kahana-Hakipuu ridge, to the Government Survey Trig. Station "Puu Ohulehule," the direct azimuth and distance being: 46° 25' 2633 feet;
44. Thence along the middle of the Kahana-Waikane ridge to a peak called "Puu Koiele," the direct azimuth and distance being: 97° 01' 2994.6 feet;
45. Thence still along the middle of the Kahana-Waikane ridge, to a peak called "Kaaumakua" on the main Koolau range, at the junction of the lands of Kahana, Waianae-uka, Waipio and Waikane, the direct azimuth and distance being: 46° 00' 6425 feet;
46. Thence Northerly along the top of the main Koolau range, along the lands of Waianae-uka, Wahiawa, Paalaa and Kawailoa, to a + on stone at the head of the land of Kaipapau;
47. 193° 59' 30" 1438.6 feet along ridge, along Kaipapau to a + on stone;
48. 189° 30' 1135.2 feet along same, to a + on stone;
49. 153° 33' 2276.5 feet along same, to a + on stone;
50. 176° 20' 2641.8 feet along same, to a + on stone;
51. 162° 09' 402.0 feet along same, to a + on stone;
52. 177° 06' 30" 3296.2 feet along same, to a + on stone;
53. 173° 21' 30" 639.9 feet along same, to a + on stone;
54. 231° 25' 592.0 feet along same, to a + on stone;
55. 210° 42' 3059.0 feet along ridge along Kaipapau to the point of beginning.

Total area, 9193 acres, more or less.

#### AREAS.

	Acres.
Hauula .....	1143
Makao .....	24
Kaluanui .....	1033
Waiono, Gr. 3025.....	47
Makaua, Gr. 1306:2 .....	48
Punaluu .....	2950
L. C. A.'s in Punaluu.....	28
Kahana .....	3920
<b>Total .....</b>	<b>9193</b>

AND, as provided by law, subject to existing rights, I do hereby set apart as part of the HAULA FOREST RESERVE that certain portion of the said government land of Hauula, containing an area of 1143 acres, more or less, which lies within the metes and bounds of the above described HAULA FOREST RESERVE.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

(Seal.)

DONE at the Capitol in Honolulu, this 31st day of December, A. D. 1918.

C. J. McCARTHY,  
Governor of Hawaii.

By the Governor:  
CURTIS P. IAUKEA,  
Secretary of Hawaii.



**PROCLAMATION OF MODIFICATION OF BOUNDARY OF THE  
MAKUA-KEAAU FOREST RESERVE, DISTRICT OF WAIA-  
NAE, CITY AND COUNTY OF HONOLULU, ISLAND  
OF OAHU, TERRITORY OF HAWAII.**

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, C. J. McCARTHY, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby modify the boundary and increase the area of the Makua-Keaa Forest Reserve, in the District of Waianae, City and County of Honolulu, Island of Oahu, Territory of Hawaii, created and set apart by proclamation of the Governor of Hawaii on June 4, 1913, and as provided by law, I do now and hereby set apart as an integral part of the Makua-Keaa Forest Reserve, subject to existing rights, that certain portion of the government land of Makua containing an area of 103.85 acres, more or less, in the District of Waianae, City and County of Honolulu, Island of Oahu, Territory of Hawaii, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2407 and "Addition to Makua-Keaa Forest Reserve" and a description accompanying the same numbered C. S. F. 2974, which said description now on file in said Survey Department is as follows:

**ADDITION TO MAKUA-KEAAU FOREST RESERVE,  
WAIANAE, OAHU.**

Portion of the Government Land of Makua.

C. S. F. 2974.

Beginning at a 1½-inch pipe at the Northeast corner of this piece, on the mauka boundary of the Makua-Keaa Forest Reservation, the co-ordinates of said point of beginning referred to Government Survey Trig. Station "Kepuhi" being 19,049.0 feet North and 11,799.0 feet East, as shown on Government Survey Registered Map No. 2407 and running by true azimuths:

1. 22° 26' 3811.1 feet across Makua Valley, along Makua-Keaa Forest Reserve to a 1½-inch pipe;
2. 79° 46' 30" 880.3 feet along same to a 1½-inch pipe;
3. 183° 43' 2993.5 feet along government land to a 1½-inch pipe;
4. 252° 00' 2237.2 feet along Makua-Keaa Forest Reserve to the point of beginning.

Area, 103 85/100 acres.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

(Seal.)

DONE at the Capitol in Honolulu, this 31st day of December, A. D. 1918.

C. J. McCARTHY,  
Governor of Hawaii,

By the Governor:  
CURTIS P. IAUKEA,  
Secretary of Hawaii.

**PROCLAMATION OF FOREST RESERVE IN THE DISTRICT OF  
PUNA, ISLAND AND COUNTY OF HAWAII,  
TERRITORY OF HAWAII.**

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, C. J. McCARTHY, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby set apart as a forest reserve to be called the OLAA FOREST RESERVE, subject to existing rights, a portion of that certain piece of government land called Olaa, in the District of Puna, Island and County of Hawaii, Territory of Hawaii, containing an area of 20,030 acres, more or less, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2250 and "Olaa Forest Reserve" and a description accompanying the same numbered C. S. F. 3026, which said description now on file in said Survey Department, is as follows:

**OLAA FOREST RESERVE.**

Portion of the Government Land of Olaa, Olaa, Puna, Hawaii.

C. S. F. 3026.

Beginning at the West corner of this reserve, and the North corner of UPPER OLAA FOREST RESERVE, the true azimuth and distance from Government Survey Trig. Station "Kulani" being  $243^{\circ} 20' 12.694$  feet, as shown on Government Survey Registered Map No. 2250, and running by true azimuths:

1.  $243^{\circ} 20' 50.151.7$  feet along WAIAKEA FOREST RESERVE;
2.  $318^{\circ} 39' 30''$  1848.9 feet along government land;
3.  $48^{\circ} 39' 30''$  12,070.0 feet along Lots 229 to 214 inclusive, Olaa New Tract, to the West corner of Lot 214;
4.  $38^{\circ} 41' 50.5$  feet across Road No. 2, to the North corner of Lot 213, Olaa New Tract;
5.  $48^{\circ} 32' 30''$  3010.9 feet along Lots 213 to 210 inclusive, Olaa New Tract, to the West corner of Lot 210;
6.  $138^{\circ} 32' 30''$  724.9 feet along Lot 264, Olaa New Tract
7.  $48^{\circ} 32' 30''$  3055.0 feet along Lot 264, Olaa New Tract, and across Road No. 3, to the North corner of Lot 265, Olaa New Tract;
8.  $318^{\circ} 32' 30''$  6583.2 feet along West side of Road No. 3 to the North corner of Lot 119A, Olaa New Tract;
9.  $48^{\circ} 32' 30''$  18,130.0 feet along Lots 119A, 118, 117, 116, 115, 120, 121, 129 and 130, Olaa New Tract, and across Road No. 6, to the East corner of Lot 53, Olaa New Tract;
10.  $318^{\circ} 32' 30''$  3.6 feet along Southwest side of Road No. 6:
11.  $302^{\circ} 21' 57.59.2$  feet along Southwest side of Road No. 6, to the North corner of Lot 99, Olaa New Tract;
12.  $34^{\circ} 08' 30''$  11,016.5 feet along Lots 99 to 85 inclusive, Olaa New Tract;
13.  $318^{\circ} 32' 30''$  2998.0 feet along Lot 85, Olaa New Tract;
14.  $34^{\circ} 08' 30''$  384.0 feet, more or less, along Northwest side of a road;
15.  $304^{\circ} 12' 55.39.0$  feet, more or less, across road, and along the Southwest side of a 30-foot road;
16.  $214^{\circ} 12' 12.30.0$  feet across a 30-foot road, and along Lot 387, Olaa Reservation Lots;

17. 304° 12' 2069.0 feet along Lots 380 and 381, Olaa Reservation Lots;
  18. 34° 12' 1230.0 feet along OLAA FOREST PARK RESERVE, and across a 30-foot road;
  19. 304° 12' 3930.0 feet, more or less, along Southwest side of a 30-foot road, to the West corner of said 30-foot road and Volcano Road;
  20. Thence along the Northwest side of Volcano Road, the direct azimuth and distance being: 45° 10' 1644.0 feet, more or less;
  21. 149° 16' 602.7 feet along government land;
  22. 88° 00' 573.7 feet along same;
  23. 117° 47' 1244.6 feet along same;
  24. 134° 18' 507.3 feet along same;
  25. 69° 01' 860.7 feet along same;
  26. 87° 39' 911.9 feet along same;
  27. 87° 35' 421.9 feet along same;
  28. 87° 55' 400.2 feet along same;
  29. 57° 22' 424.1 feet along same;
  30. 160° 31' 30" 213.3 feet along same, and across Kilauea Road to the South corner of Lot 2B, Brughelli Settlement Association;
  31. 59° 31' 13,218.0 feet along the Northwest side of Kilauea Road, to the North corner of said Kilauea and Hinano Roads;
  32. 149° 31' 15,000.0 feet along the Northeast side of Hinano Road, and along the Kilauea Settlement Association Lots and UPPER OLAA FOREST RESERVE;
  33. 239° 31' 5858.0 feet along UPPER OLAA FOREST RESERVE;
  34. 329° 31' 3000.0 feet along same;
  35. 239° 31' 4492.0 feet along same;
  36. 138° 32' 30" 26,210.0 feet along UPPER OLAA FOREST RESERVE, to the point of beginning.
- Area, 20,030.0 acres, more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

(Seal.) DONE at the Capitol in Honolulu, this 31st day of December, A. D. 1918.

C. J. McCARTHY,  
Governor of Hawaii.

By the Governor:  
CURTIS P. IAUKEA,  
Secretary of Hawaii.

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**PROCLAMATION OF WITHDRAWAL OF CERTAIN LAND FROM  
THE OLAA FOREST PARK RESERVE, DISTRICT OF  
PUNA, ISLAND AND COUNTY OF HAWAII,  
TERRITORY OF HAWAII.**

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UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, C. J. McCARTHY, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, having held the hearing of which notice has been duly given all as in said laws provided, do hereby withdraw and eliminate from Section C of the Olaa Forest Park Reserve, in the District of Puna, Island and County of Hawaii, Territory of Hawaii, created and set apart by Proclamation of the Governor of Hawaii on August 20, 1914, that certain portion of the government land called Olaa, containing 30,000 square feet, in the District of Puna, Island and County of Hawaii,

Territory of Hawaii, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2577 and "Territory of Hawaii to F. G. Snow, Portion of the Forest Reserve Between the Volcano Road and Lot 328 of the Olaa Reservation Lots," and a description accompanying the same numbered C. S. F. 3027, which said description now on file in the said Survey Department is as follows:

TERRITORY OF HAWAII TO F. G. SNOW,

Portion of the Forest Reserve between the Volcano Road and Lot 328, of the Olaa Reservation Lots, Olaa, Puna, Hawaii.

C. S. F. 3027.

Beginning at the South corner of this piece, on the Northwest side of Volcano Road, said point being  $214^{\circ} 12'$  660.8 feet from the North corner of Volcano Road and a 30-foot side road, the coördinates of said point of beginning referred to Government Survey Trig. Station "Olaa" being 42,654.0 feet South and 34,468.3 feet West, as shown on Government Survey Registered Map No. 2577, and running by true azimuths:

1.  $124^{\circ} 12'$  150.0 feet along Forest Reserve (government land);
  2.  $214^{\circ} 12'$  200.0 feet along Lot 328, Olaa Reservation Lots;
  3.  $304^{\circ} 12'$  150.0 feet along Forest Reserve (government land);
  4.  $34^{\circ} 12'$  200.0 feet along Volcano Road to the point of beginning.
- Area, 30,000 square feet.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the Territory of Hawaii to be affixed.

(Seal.)

DONE at the Capitol in Honolulu, this 31st day of December, A. D. 1918.

C. J. McCARTHY,  
Governor of Hawaii.

By the Governor:

CURTIS P. IAUKEA,  
Secretary of Hawaii.



# History of Botanical Exploration in Hawaii

By Prof. VAUGHAN MACCAUGHEY, College of Hawaii.

(Continued.)

## 17. THE VISIT OF MACRAE.

An enthusiastic naturalist, who made extensive collections of botanical and other natural history material in the Pacific region, was James Macrae. During the years 1824 to 1826 he botanized in various parts of South America and in the Islands of the Pacific, including Hawaii. His collections have been widely distributed by exchange, and now appear in private and institutional herbaria in many parts of the world. A number of Hawaiian plants, and plants in other regions where he collected have been named in his honor.

## 18. VISIT OF LORD BYRON IN THE "BLONDE."

*"Blonde" Arrived May 4, 1825.*

*Botany and Natural History.*

In 1823 Liholiho and the Queen, with several others, voyaged to England, where both the King and his wife succumbed to the measles. The frigate "*Blonde*," commanded by Lord George Anson Byron, cousin of the famous poet, was commissioned to convey the bodies, and the remainder of the party, back to their native land. The "*Blonde*" arrived off Lahaina, May 4, 1825. Proceeding to Honolulu, impressive ceremonies were performed. Under May 9, the narrative states: "This day our botanist and naturalist have begun their researches." In the preface is stated, "For the few notices concerning natural history which the work contains, it is chiefly indebted to the zealous attention of Mr. A. Bloxam, brother to the Chaplain of the *Blonde*. . . . It is to be regretted that the practiced collector of botanical specimens who went in the *Blonde* to the Sandwich Islands should not have furnished any account of the plants, useful or curious, which he collected for the Horticultural Society . . . it is acknowledged by all the foreign navigators, that the collection made during the *Blonde's* voyage is one of the most curious in Europe."

*Hilo and Kilauea. June 7-July 7.*

On June 7th Byron sailed for Hilo, where he stayed for one month. An accurate survey was made of the bay ("Byron's Bay"); the crater of Kilauea was visited and carefully studied; an excursion made to the summit of Mauna Kea; and other trips along the coast and into the forest.

Byron returned to Honolulu for four days, sailed to Kealakekua Bay and erected a memorial to Captain Cook, and then sailed for England.

Several Hawaiian plants were named in honor of Lord Byron. The indigenous holly, *ka-wau*, (*Ilex sandwicensis* (Endl. Loes.), was originally named *Byronia*. *Spodiopogon Byronis*, Trin., was also named for him.

#### 19. VISIT OF LAY AND COLLIE.

1826-1827.

George T. Lay and Alexander Collie were botanical collectors who accompanied Captain Beechey on the voyage of the "Blossom." These two men secured the material from which Hooker and Arnott made their report upon the botany of Captain Beechey's voyage, which was published in 1830-1841. A very considerable number of new Hawaiian plants were collected by Lay and Collie, and were described for the first time by Hooker and Arnott. The names of the two latter workers have become specific names for several indigenous plants.

#### 20. VISIT OF DAVID DOUGLAS.

1833.

David Douglas was sent out by the London Horticultural Society, to make collections of noteworthy plants. He made valuable collections of the Hawaiian flora, which are preserved in the herbaria of Hooker, Bentham, and Lindley. Douglas died as a martyr to the science which had engrossed his life. During a botanizing expedition on the Island of Hawaii, he fell into a cattle-trap—a pit designed to entrap wild cattle, and set with wooden spikes—and was killed. His name is immortalized as the specific name of a number of Hawaiian ferns.

#### 21. THE UNITED STATES EXPLORING EXPEDITION.

Sept., 1840, to April, 1841.

The United States Exploring Expedition, commanded by Commodore Charles Wilkes, spent a number of months at the Hawaiian Islands, in 1840-41. As stated by Alexander, "Their intercourse with the King and people was of the most friendly nature, while their researches have proved to be of great value to science. An observatory was built on the summit of Mauna Loa, and occupied for three weeks in the middle of winter, and surveys were made of the principal craters on Hawaii as well as of all the important harbors of the group."

*Life of Wilkes.*

Charles Wilkes, American naval officer and explorer, was born in New York City, April 3rd, 1798. Entered American Navy in

1818. In 1838 he was appointed to command an exploring and surveying expedition through the oceans of the southern hemisphere. The expedition, including a large staff of scientists, was carried by the "*Vincennes*," "*Peacock*," "*Porpoise*," "*Relief*" and two tenders. They left Hampton Roads Aug. 18, 1838; visited Madeira, Rio de Janeiro, Tierra del Fuego, Chile, Peru, the Paumotu, Samoa, and Australia.

From Sydney they sailed into the Antarctic, and Wilkes had the honor of discovering the Antarctic continent. Wilkes Land was later named for him. They visited Fiji and Hawaii in 1840; explored the west coast of the United States in 1841, and returned by way of the Philippines, Sulu, Borneo and Cape of Good Hope, reaching New York on June 10, 1842. From 1844-1861 Wilkes was chiefly engaged in preparing the report of the expedition. Twenty-eight volumes were planned, but only nineteen were published. Of these Wilkes wrote the narrative, Hydrography and Meteorology; Professor James D. Dana wrote the three reports on Zoophytes, Geology, and Crustacea; and Asa Gray wrote the botanical reports. Wilkes participated in the Civil War. In 1866 he was given rank of rear-admiral and placed on the retired list. He died at Washington, Feb. 8, 1877.

### *Botanical Work.*

Numerous expeditions were made by various parties of the Wilkes' staff to many points on Kauai, Oahu, Maui and Hawaii. The high mountains were ascended, and extensive botanical collections resulted from the thorough field work.

The botanical results of the expedition (Phanerogamia) were prepared for publication by the celebrated botanist Asa Gray. He described a large number of new species from Hawaii, and a number of new genera. His work was published in a large quarto of nearly eight hundred pages, together with a folio atlas of one hundred plates (1854). A number of Hawaiian plants were named by him in honor of the naturalists of the expedition, for example—*Cyrtandra Pickeringii*, *Hibiscus Brackenridgei*, and the genus *Wilkesia*.

(*To be continued.*)

# J. M. DOWSETT

AGENT

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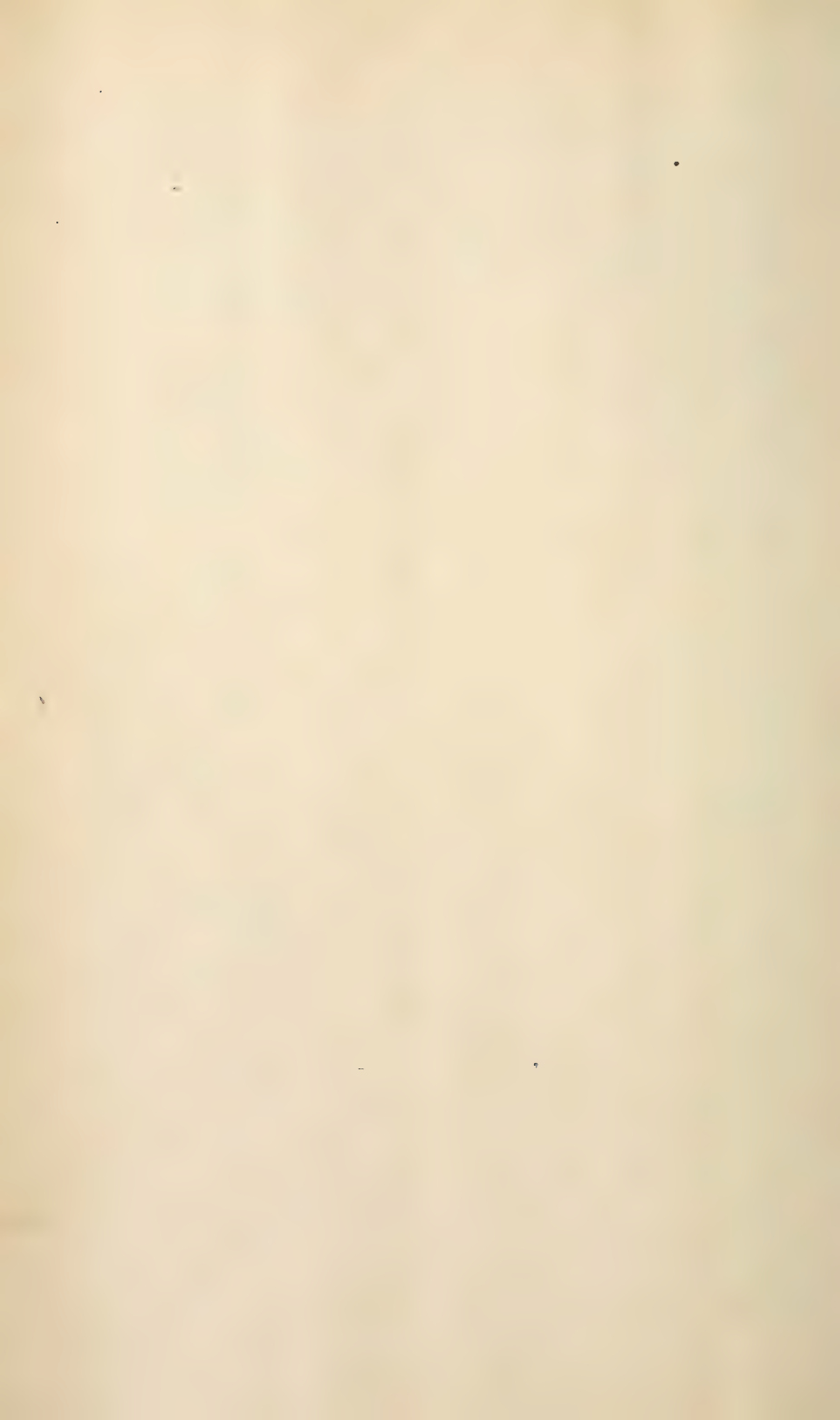
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

JANUARY, 1919

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# Board of Agriculture and Forestry

## DIVISION OF FORESTRY.

### FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

## PUBLICATIONS FOR DISTRIBUTION.

The Board of Commissioners issues for general distribution to persons in the Territory, annual reports, bulletins, circulars, copies of its rules and regulations, and other occasional papers, which may be had, free, upon application.

A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, JANUARY, 1919.

No. 1

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An interesting experiment in the relative durability and strength of reenforced concrete and ohia posts has been initiated in forest reserve fencing just completed near Glenwood, Hawaii.

During December the Division of Plant Inspection assisted in the conservation of food and for the accommodation of local people fumigated over twelve thousand bags of flour, rice, corn and beans.

The work of protecting forest reserve lands against damage by stock was advanced during the year just ended by the construction of 9.73 miles of new fences and repairing 3.84 miles of existing fences on forest reserve boundaries.

The new forest reserves set apart by the Governor on the last day of 1918, added 41,335 acres to the general reserve system and brought the total acreage of the 47 reserves up to 814,926 acres, of which 68 per cent is government land.

Among the trees which are being planted in the Lualualei Forest Reserve, Oahu, in a comparatively dry region in the Waianae Mountains in order to reestablish the forest cover are the native wiliwili and koa, and the kassod, yellow poinciana, and gum arabic.

The lessons from the severe windstorm of December 3, 1918, are that it is not well to have shallow rooted trees near one's house, and that to save large algaroba trees they should be topped every few years. The native forests in the mountains seem to have come through the storm with comparatively no damage.

The progress report of the Superintendent of Forestry on the yield of the eucalyptus trees in the Nuuanu experiment after five years of growth shows that, while on the whole the trees have not done very well, the blackbutt, *Eucalyptus pilularis*, is a suitable tree to plant in similar situations where the annual rainfall is 175 inches.

Bulletin No. 4 of the Division of Entomology, "The Corn Leaf Hopper," by Entomologist D. T. Fullaway, was issued on De-



ember 27, 1918. This bulletin, which contains 16 pages, and is well illustrated, should be of material assistance to corn growers throughout the Territory, and a copy will be mailed to anyone who applies to this Board.

---

This Board would appreciate prompt notice of the presence of any new plants of a suspicious nature found by anyone. In spite of all precautions, new plant pests are apt to gain entrance in the Territory. An instance of this is the morning glory weed found recently on Maui and reported on in this issue. Only by prompt measures at the early stage of introduction can such chance introductions be prevented from becoming established here.

---

The welcome articles printed in this issue on dairy subjects by Prof. Ralph J. Borden of the Kamehameha Schools will, it is hoped, inspire other dairymen in the Territory to adopt more modern methods which will result in improvement in the production of milk. Similar articles on any agricultural subject which will interest the farmers and ranchers in the Territory are solicited and will gladly be given space on the pages of THE FORESTER.

---

Hawaii has again been slighted in a federal appropriation act simply because the word "Territories" was not included in the bill which provides for federal indemnities for tuberculous cattle. The matter has been taken up with our Delegate to Congress who has given us assurance that he will do all in his power when the new appropriation bill is enacted to have Hawaii included to receive the benefits to which she is justly entitled on account of the long continued efforts of this Board at eradicating bovine tuberculosis in the Territory.

---

### MORNING GLORY WEED.

---

Attention was called in the *Hawaiian Planters' Record* of November, 1918, to the unwelcome appearance of a weed, new to the Territory, which was discovered lately on Maui. This is the Morning Glory or Bindweed (*Convolvulus arvensis*), originally a resident of Europe and Eastern Asia which has become naturalized in old fields through the Atlantic States and California, where it is a very troublesome weed. It was a bad pest in England even 100 years ago because it wandered over whole fields and could not be eradicated except by repeated plowings in dry weather, and then picking out the roots and burning them. The roots run very deep into the ground and have caused the plant to be called "devil's guts."

If allowed to spread in these Islands where there is no annual frost to check its growth, it would doubtless become a very great pest and all residents are strongly urged, if it should ever come to their attention, to dig it out part and parcel and burn every bit

of it, since any piece of root or stem may sprout and form new plants.

So far, it has been found fortunately in only two places on Maui, along the Kahului Railway on land controlled by the Paia Plantation, and every effort has been made by the plantation people to eradicate it completely. One of the patches where it has been dug out is only 7 by 20 feet in size and the fact that each patch is found along the railroad track leads one to believe that it came into the Territory in baled hay or along with some similar feed material.

Chance introductions such as this, of an undesirable nature, are apt to occur in spite of all precautions, but this should make us all the more alert in detecting them and preventing by all possible means their establishment in the Islands.

C. S. J.

---

### KOKEE CAMPS.

---

In response to suggestions made by the Kauai Chamber of Commerce, the Board of Agriculture and Forestry at a meeting held on January 21, 1919, reconsidered certain phases of the camping privileges to be given in the Na Pali-Kona Forest Reserve, Kauai, with the following results:

The annual charge for camping permits on unimproved sites has been reduced from \$25 to \$10 per acre.

For the present a bond with each permit will not be required but the Board reserves the right to require a bond of each permittee on the first breach of the conditions set forth in the permit on the part of any permittee.

The term for which the permits will be issued is lengthened from five to ten years. It is believed that this change will obviate the necessity of including any renewal clause in the permit and will induce permittees to put in camps which will be comfortable.

Applications for these camps will be received now at any time by the Superintendent of Forestry and will receive attention in the order of their receipt.

A good opportunity is offered here to those who are fond of camping and seek recreation and rest at an elevation where the climate is invigorating and there is a great variety of most interesting scenery.

C. S. J.

---

### WOOD FOR HANDLES.

---

The annual demand for wood by handle makers in the United States approximates 280 million feet, consisting of 33 kinds, is the statement made in an article by Hu Maxwell in *American Forestry* for November, 1918. Nearly all of the handles are made of hardwoods, but certain softwoods fill definite wants,

such as the cheap hemlock wooden handle for buckets and the aspen wood handle for the oysterman's shucking knife, which when made of this wood does not slip when in contact with oysters.

A large amount of foreign woods such as cocobola, mahogany and ebony is used in the tool trade. These woods are expensive and when used for making knife handles may cost thirty or forty cents a square foot. But such woods are used in very small pieces on each knife as a thin splint on each side. A board foot of such wood will therefore supply enough handles for a hundred pocket knives.

Ash is the leading wood for farm tool handles and hickory is unsurpassed for the elastic handles required for axes and sledge hammers. The accepted wood for a handsaw handle is apple-wood and the yearly demand for such wood is over 150,000 feet. It comes from the old apple orchards where trees are cut to make way for improvements.

C. S. J.

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## Division of Forestry

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Honolulu, Hawaii, December 31, 1918.

*Board of Commissioners of Agriculture and  
Forestry, Honolulu.*

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of December, 1918:

### FOREST FENCING.

The repairs to the old fence on the part of the boundary of the new Waiahole Forest Reserve, Oahu, adjacent to Kaalaea, were completed on December 16, and a total distance of .81 mile of boundary was made impassable to stock.

The new fence around parts of Sec. C of the Olaa Forest Park Reserve, between Glenwood and 23½ Miles in Olaa, Hawaii, was completed on December 28. The total length of this new fence is 3.56 miles, and since concrete posts were used in its construction it should last a very long time and should serve well its purpose of keeping the wandering dairy stock from doing any further damage to the attractive tree fern and ohia forests within its bounds.

On December 16 a visit was made to that part of the Makua-Keaau Forest Reserve, Oahu, which is adjacent to Lot 1 of the Keaau Homesteads, and it was found that no fence on this boundary kept the homesteaders' cattle from entering the forest reserve. The homesteader has agreed to cooperate in building the half mile of fence that will be needed to protect the reserve at this point and the work will be undertaken in January.

On December 8, during a visit to the Kuliouou Forest Reserve in which six goats were killed out of a flock of nine, which was found at the edge of the forest in the reserve, it was ascertained that the Club Stables, Ltd., holder of General Lease No. 837, had not done anything toward constructing the required fence which the lease specifies to have been built on November 4, 1914. This default has been repeatedly called to the attention of the Land Commissioner and I once more notified that official that this requirement had not yet been fulfilled. I also notified him that L. L. McCandless, holder of General Lease No. 730, had not yet built the required fence on the boundary of the Makua Forest Reserve which should have been completed on June 4, 1914, and he reports that the lessee has promised to begin the construction of this fence early in January.

During the month Ranger Lovell, in addition to planting trees, has been repairing a few sections of the fence on the boundary of the Kealia Forest Reserve, Kauai, which were damaged by storm.

A summary of the fencing work done during 1918 is as follows:

Existing fences on forest reserve boundaries repaired—	
Oahu, Pupukea Reserve .....	1.19 miles
Maui, Makawao Reserve .....	.53 "
Maui, Makawao Reserve .....	1.31 "
Oahu, Waiahole Reserve .....	.81 "

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Total length of fences repaired.....	3.84 miles
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New fences constructed on forest reserve boundaries—	
Hawaii, Hilo Reserve .....	3.42 miles
Oahu, Waianae-kai Reserve .....	.22 "
Maui, Makawao Reserve .....	.89 "
Oahu, Waiahole Reserve .....	.59 "
Oahu, Hauula Reserve .....	1.05 "
Hawaii, Olaa Forest Park Reserve.....	3.56 "

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Total length of new fences constructed.....	9.73 miles
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Total length of reserve boundaries made im- sable to stock .....	13.57 miles
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#### FOREST PLANTING.

The Division performed the following tree planting during December:

Oahu, Honolulu Watershed Reserve, Makiki—Koa..	185 trees
Oahu, Lualualei Reserve, Mikilua—Koa.....	607 "
—Wiliwili .....	414 "
Kauai, Kealia Reserve, Kamalomalo, Swamp Ma- hogany .....	76 "

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Total .....	1282 trees
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The new nursery at Mikilua was supplied with about 10,000



small seedlings of the following species which were transplanted and will be held in the nursery until ready for final planting: Koa, wiliwili, yellow poinciana, kassod, gum arabic and monkey-pod.

With the Forest Nurseryman one day was spent in inspecting the planting of trees on Water Reserve A, Pupukea, Oahu, which is being done by Libby, McNeill & Libby under the agreement between this Board and Macfarlane & Robinson of March 18, 1914, which was transferred to them on July 21, 1916. It was found that the work was being done in a substantial manner and that  $1\frac{1}{2}$  acres had been made ready for the trees by plowing and hole digging.

On December 20, reply post cards were sent out to all tree planters in the Territory with the request that they submit to this Division for regular statistical purposes the number of trees by species set out during 1918 and the purpose of planting.

During the month the measurement of the trees, in the eucalyptus plantation established in 1911 in Nuuanu Valley, taken five years after planting were finally worked up and the results in height and diameter growth and yield in cubic feet of wood and in cord per acre are given in the attached report. Owing to certain adverse conditions, the trees on the whole have not shown up remarkably well as compared to other standards, but of all the trees the Blackbutt (*Eucalyptus pilularis*) gives the greatest promise with a maximum height of 34 feet, a maximum diameter of 6 inches and a yield of 4.51 cords per acre.

#### FOREST PROTECTION.

Ranger Hardy reports that the horses which were being pastured on Kumuwela Ridge in the Na Pali-Kona Forest Reserve, Kauai, a matter which I touched on in my November report, have been removed from the reserve.

At the suggestion of Commissioner Giffard I secured an opinion from the Attorney General of the Territory dated December 19, 1918, as to how far one could go in exterminating, without compensation, privately owned stock running wild on land held as forest reserve, and this will be used as a basis in drafting a new law to authorize such extermination which will soon be presented to you for consideration.

#### WIND STORM.

The wind storm of December 3 did considerable damage to the algaroba trees in the Animal Quarantine Station on Ala Moana, Honolulu, and to a few of the trees in the grounds at the Government Nursery on King Street; and in the lower part of the eucalyptus forest on Tantalus 175 trees were thrown across the road and many others uprooted. We have been attempting to secure a purchaser for the wood in these eucalyptus trees but, on account of the abundance of the better algaroba wood available for market, no one will even look at this eucalyptus wood. An

appeal has been made to the High Sheriff to get it removed by prison labor and we are also trying to dispose of the small branch wood by interesting a charcoal burner in the proposition.

Immediately after the storm a suggestion was made to the public through the press to use care in trimming trees injured by the storm by cutting off stubs close to the main trunk and applying creosote or paint to the exposed wood surfaces to prevent rot.

It was observed that the algaroba suffered most heavily in the storm on account of the shallow root system of this tree, and that the yellow poinciana, on account of its somewhat shallow root system and great weight came next. The coconut and royal palms on account of their smaller exposed surface, but in spite of their small root system, came through the storm remarkably well.

So far as I have been able to ascertain the storm did practically no damage to the trees in our indigenous forests in the mountains. Ranger Hardy reports from Kauai:

"In making my monthly rounds through the mountains I was agreeably surprised to find that the wind storm in November had done very little damage to the standing timber. On the trip across the range to the Hanalei and Kalihiwai Rivers I saw but one tree that had been uprooted by the wind, while in making the same trip in the month of January, 1916, I saw hundreds of trees that had been blown down; in fact, my trail in places was entirely obliterated by the tangle of windfall timber."

#### NEW FOREST RESERVES.

The work of examining and setting apart the general forest reserve system in the Territory was completed on the last day of the month when, after a public hearing of the Governor and this Board held on December 31, at the Government Nursery, at which no objections to the new reserves were made, Governor McCarthy signed proclamations setting apart five new reserves and making one addition, thus increasing the total area by 41,355 acres. The new reserves are as follows:

Nonou Forest Reserve, Kauai.....	818	acres
Puukapele Forest Reserve, Kauai.....	4,900	"
Mokuleia Forest Reserve, Oahu.....	6,290	"
Hauula Forest Reserve, Oahu.....	9,193	"
Addition to Makua-Keaau Reserve, Oahu.....	104	"
Olaa Forest Reserve, Hawaii.....	20,030	"

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Total .....41,335 acres

The present total area of forest reserves in the Territory is now 814,926 acres, of which 554,842 acres or 68% is government land.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, December 31, 1918.

*Superintendent of Forestry, Honolulu.*

DEAR SIR:—I herewith submit a report on the principal work done during the month of December:

## NURSERY.

*Distribution of Plants.*

	In Seed Boxes.	In Transplant Boxes.	Pot Grown.	TOTAL.
Sold . . . . .	....	....	181	181
Gratis . . . . .	....	750	979	1729
Lualualei Reserve ....	2000	300	186	2486
	<hr/> 2000	<hr/> 1050	<hr/> 1346	<hr/> 4396

## COLLECTIONS.

*Government Realizations.*

Collections on account of plants sold.....	\$ 3.90
Sale of aged horse .....	50.00
Rent of office, Nursery Grounds, October.....	35.00
<b>Total</b> .....	<hr/> \$88.90

## PRESERVATION FOREST RESERVE.

*Collections for the Quarter Ending December, 31, 1918.*

Rents and fees .....	\$ 82.00
Sale of black sand .....	36.50
<b>Total</b> .....	<hr/> \$118.50

## PLANTATION COMPANIES AND OTHER CORPORATIONS.

Orders have been received for 10,000 transplants ready to set out, delivery to be made when ready.

## MAKIKI STATION.

The work at this station has been principally routine. Owing to the great demand for trees during the past two or three months our stock is considerably reduced. We have a large number of plants coming on and will have plenty again in a short time.

## HONOLULU WATERSHED.

The work done in the Makiki Valley and Sugarloaf sections consisted of hoeing and cleaning, also the planting of 185 koa trees. Preparations are being made for the planting of more koa trees in Opu Valley.

## ADVICE AND ASSISTANCE.

The writer has made the following number of calls and otherwise given advice and assistance at the request of people in and around the city:

Calls made .....	7
Advice given people calling.....	8
Advice given by telephone.....	5

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## Division of Entomology

Honolulu, Hawaii, January 16, 1919.

*Board of Commissioners of Agriculture and  
Forestry, Honolulu.*

GENTLEMEN:—During the month of December the insectary handled 21,900 pupae of the melon fly, from which 2641 females and 2411 males of *Opius fletcheri* were bred.

The distribution of parasites was as follows:

## MELON FLY PARASITES.

*Opius fletcheri.*

Oahu:

	<i>Females.</i>	<i>Males.</i>
Moiliili . . . . .	1320	1510
Kailua . . . . .	640	750

Hawaii:

Kamuela . . . . .	800	960
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## FRUIT FLY PARASITES.

*Opius humilis.*

Oahu:

Nuuanu Valley . . . . .	130	90
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*Diachasma tryoni.*

Oahu:			
Nuuanu Valley	.....	250	180

*Diachasma fullawayi.*

Nuuanu Valley	.....	20	35
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*Tetrastichus giffardianus.*

Oahu:			
Nuuanu Valley	.....	....	250

*Galesus silvestri*

Oahu:			
Nuuanu Valley	.....	....	300

*Dirhinus giffardi.*

Oahu:			
Nuuanu Valley	.....	....	400

## DUNG FLY PARASITE.

*Spalangia cameroni.*

Oahu:			
Moanalua	.....	....	600

## CORN LEAF HOPPER EGG PARASITE.

*Paragranus osborni.*

Oahu:			
Makiki Nursery	.....	....	9,600
Kailua	.....	....	23,000
Kaimuki	.....	....	4,900
Hawaii:			
Hilo	.....	....	1,400
Kohala	.....	....	1,500

Respectfully yours,

DAVID FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, December 31, 1918.

*Board of Commissioners of Agriculture and  
Forestry, Honolulu, T. H.*

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of December, 1918, as follows:

During the month there arrived at the Port of Honolulu 64 vessels, of which 18 carried vegetable matter subject to inspection and two came via the Panama Canal. The following disposal was made of the various shipments:

DISPOSAL.	<i>Lots.</i>	<i>Parcels.</i>
Passed as free from pests.....	533	25,068
Fumigated . . . . .	10	67
Burned . . . . .	22	23
Returned . . . . .	1	1
	<hr/> 566	<hr/> 25,159

Of these shipments 24,979 parcels arrived as freight, 82 packages as mail and 98 packages as baggage.

### RICE AND BEAN SHIPMENTS.

During the month 22,289 bags of rice and 2080 bags of beans from foreign ports were inspected and found apparently free from pests.

### PESTS INTERCEPTED.

Approximately 4886 pieces of baggage belonging to passengers and immigrants from foreign ports were examined, from which 11 lots of fruits and eight lots of vegetables were taken and burned.

On December 8, six pots of sealing wax palms from Java were fumigated to destroy a nest of ants, *Monomorium pharaonis*, and a small scorpion which were found at the base of the leaves. The soil was removed and sterilized in the incinerator before being dumped.

On the same date a small case of orchids in the baggage from Java was fumigated for an infestation of ants, *Monomorium pharaonis*, and a scale insect.

On December 19 a case of orchids from Manila was fumigated as a precaution.

On December 19 four packages of ornamental plants in the baggage from Japan were fumigated as a precaution and one package which contained five-needle pines was burned, being prohibited by the Federal Horticultural Board.

On December 23 two small pots of *Thuya orientalis* in the baggage from Japan were fumigated and the soil removed. In the soil 112 grubs of a Curculionid beetle were found.

On December 26 a parcel of acorns in the mail from Japan was found infested with weevils and burned.

On December 23 a package of plum pits in the mail from Japan was returned by the postal authorities.

During December the following cereals, etc., have been fumigated for the accommodation of local people:

10,415	bags	flour.
1,732	bags	rice.
98	bags	awa root.
54	bags	corn.
55	bags	beans.

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Total..... 12,354 bags.

#### HILO INSPECTION.

Brother M. Newell reports the arrival at Hilo of three steamers, one of which carried vegetable matter consisting of four lots and 161 parcels, all of which were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Will Cooper reports the arrival of seven vessels at the port of Kahului, one of which carried vegetable matter, consisting of 19 lots and 319 packages, all of which were passed as free from pests.

#### INTER-ISLAND INSPECTION.

Fifty-seven steamers plying between Honolulu and other Island ports were attended and the following shipments were passed as free from pests:

Taro.....	348	bags
Vegetables.....	161	packages
Fruit.....	144	"
Plants.....	80	"
Sugar cane.....	17	cases

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Total passed..... 750 packages

Four packages of fruit and twenty packages of plants were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

## Division of Animal Industry

Honolulu, Hawaii, January 17, 1919.

*Board of Commissioners of Agriculture and  
Forestry, Honolulu.*

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of December, 1918:

### BOVINE TUBERCULOSIS CONTROL.

With the ending of the month of December there has been expended of the indemnification fund for condemned tuberculosis cattle the sum of \$16,023.54, leaving \$3,917.46 with which to continue the work for the remaining part of the fiscal period or until the next legislature decides as to the further extension of this work.

That the policy of the Board in attempting to eradicate bovine tuberculosis has been sound is now fully proven. Not alone have a majority of the States in the Union enacted laws along the same lines as our indemnification act, but the 1919 federal agricultural appropriation bill, which was passed by Congress on October 1, 1918, provides for the payment by the federal department of agriculture of one-third of the difference between the appraised value of the condemned cattle and the salvage value of the carcass. The bill further provides that in order to benefit by this act the State, county or community where the cattle are kept or owned must be cooperating in the tuberculosis work and must pay at least an equal amount to the owner. In other words, when the bill becomes effective, the Territory will save about one-third of the compensation now being paid.

At the present time, however, the bill as passed by Congress omits the word "Territory," mentioning only counties, States and municipalities, which, according to advice received from Washington, bars this Territory from participating in the appropriation. All correspondence pertaining to this subject is herewith appended. But the main point is that the Attorney General of the Territory is of the opinion that the suggestion contained in the letter from the Chief of the Bureau of Animal Industry to the effect that federal indemnities might be paid in cooperation with the counties of Hawaii instead of with the Territory as a unit is impractical and could not be effected without legislative action.

The whole matter has been explained to our Delegate to Congress, and it is to be hoped that the next Congress, which convenes on March 4th, will continue this policy of partial indemnification and that the unfortunate omission of the Territory will be corrected.



The principal part of the past month has been occupied by the preparation of the next biennial report which will shortly be ready for the printer.

Respectfully submitted,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.

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## REPORT OF ASSISTANT VETERINARIAN.

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Honolulu, Hawaii, December 31, 1918.

DOCTOR V. A. NÖRGAARD,  
*Chief, Division of Animal Industry,  
Board of Agriculture and Forestry, Honolulu, T. H.*

SIRS:—I beg to submit the following report for the month of December, 1918:

### TUBERCULOSIS CONTROL.

	Total.	Passed.	Condemned.
Salvation Army Home . . . . .	8	8	0
Kamehameha School . . . . .	1	1	0
J. D. Dole . . . . .	2	1	1
Mills School . . . . .	18	18	0

A total of 29 head were tested, out of which one was condemned and branded. This animal has since been slaughtered.

This brings to a close the 1918 tuberculin test, the result of which will appear in the biennial report.

### IMPORTATIONS OF LIVE STOCK.

S. S. Siberia, Maru, Orient: 1 dog, G. Yesaki.  
S. S. Kawi, San Francisco: 1 dog, Jos. Medeiros.  
S. S. Enterprise, San Francisco: 2 crates birds, 1 crate chickens, Amer. Ry. Ex. Co.; 13 Holstein cows, 1 Holstein calf, D. Yamashita; 4 Holstein cows, 1 Holstein bull, 10 Jersey cows, 1 Jersey bull, C. W. Lucas.  
S. S. Sonoma, San Francisco: 1 dog, Mrs. H. Holmes; 1 dog and 1 cat, Mrs. T. Hassen.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

## For the Dairyman

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EIGHT REASONS FOR KEEPING MILK RECORDS AT THE KAMEHAMEHA SCHOOLS FARM, WHICH ARE EQUALLY TRUE WHEN APPLIED TO OTHER ISLAND HERDS.

By PROF. RALPH J. BORDEN.

- 1—They form the basis upon which the dairy herd is being continually improved. No dairyman can afford to buy a herd bull whose dam does not have an authentic record of milk and butterfat production. Nor can any dairyman afford to raise calves to maturity unless he has every assurance that they will prove worth raising.
- 2—They enable the feeder to feed each cow according to the quantity of milk she produces. Present high cost of concentrate feeds makes it necessary that every cow pay in milk production for the feed she consumes.
- 3—They stimulate better feeding and breeding. The use of a balanced ration is soon evident in the way the cows respond at the pail. The daughters of the best producers usually give proof at an early age of their ability to surpass their dam in milk secretion.
- 4—Records enable the dairyman to sell cows where other qualities fail. A cow with a record of production is worth 25% to 50% more than one without.
- 5—The weighing of the milk keeps the owner in close touch with the daily condition of the cow. There are many cases of serious illness which could have been prevented in their early stages when the milk record began to drop and give evidence of something wrong with the animal's condition.
- 6—Records stimulate better milking. They serve as a check on the milker, and induce him to milk more thoroughly than when the milk is not weighed.
- 7—A knowledge of what each animal is doing develops personal pride and interest in the herd.
- 8—They make dairying a business proposition and in more ways than one mean more money to the owners.

It takes about a minute a day to weigh and record the milk of each cow, but it is a minute well spent and one which will amply pay for itself. Try it, dairymen, on a few cows, and see how quickly you will appreciate the value of keeping milk records.

## INFLUENCE OF THE PUREBRED REGISTERED SIRE

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BY PROF. RALPH J. BORDEN.

Much has been said and written on the influence of the dairy sire in increasing production of dairy herds, and yet a great many of our dairymen still think that "a bull is a bull" and continue to use the scrub sire.

No better example of the value of a good purebred sire can be found than in one of our Island dairy herds, where by continued use of purebred sires the herd production has been materially increased during the last five years. In the year 1914 the daily average per cow was 15.8 pounds of milk. In 1917 it was 22.1 pounds, and for the first six months of 1918 it was 22.4 pounds. The average per cent of butterfat has also increased from 3.1% in 1914 to 3.35% last year, and all this improvement has come about without any increase in the amount of grain ration being fed.

To be more specific: A grade Holstein cow—sire and dam unknown—produced in her best average lactation period (9 mos.) 6561.3 pounds of milk, containing 223.08 pounds of butterfat. One of her daughters from a registered sire, at 5 years of age, produced 8600.4 pounds of milk, containing 288.11 pounds butterfat. Another daughter by a registered sire, at 4 years of age, produced 7491.1 pounds of milk and 277.2 pounds fat, and would have done better had she not accidentally lost one quarter.

Another instance: Two purebred Holstein heifers among a lot imported in 1915 were bred to purebred sires owned in California. No. 1 was of only average breeding herself and had not the ideal dairy temperament, being somewhat beefy. No. 2 was a type, well bred animal, her dam and seven nearest dams all being A. R. O. cows and she herself later made an A. R. O. record in Hawaii. No. 1's daughter has surpassed No. 2's daughter in both milk production and butterfat. Concisely this is what we have: Two cows whose sires are of equal value but dams of unequal value, and the progeny of the poorer dam proving superior to that of the better dam. This tends to prove that the sire is the dominating factor in the improvement of dairy cattle.

There are many other instances of grade cows sired by registered bulls which are surpassing their dam's best lactation periods during their first or second years of production; more visible evidence of the value of the purebred sire.

And in this connection it might be urged upon our dairymen and farmers that they be not satisfied with a "so called purebred bull" but that they demand that he be registered with some particular breed association. This is a guarantee that the bull really is what he is represented to be and may prove of much value as the bull grows older.

## A COW TESTING ASSOCIATION FOR HAWAII.

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BY PROF. RALPH J. BORDEN.

The scarcity and high prices of dairy products during the past year in Hawaii make it more than imperative for our dairy industry to be improved. It would seem that every step possible to improve the Island dairy herds should be taken to enable Hawaii to produce all of her own dairy products. The recent laws governing the control of cattle tuberculosis are doing a great deal to stamp out this disease which has cost dairymen so much. Something is now needed which will improve the quality of the dairy cattle that are already here.

Until the past year, when the largest retail milk depot began to purchase their milk and pay for it on the basis of the butterfat it contained, very few of our dairymen had any idea of the importance of the butterfat in milk. "A cow was a cow" so long as she gave down the lacteal fluid. Recently several dairymen near Honolulu have begun to study their herds with a view of increasing their butterfat. The present, then, would seem an opportune time for the beginning of cow testing association work in Hawaii.

The advantages to be derived from such an association would be many and it would do much to improve dairy herd conditions. Wherever cow testing has been started, an almost immediate improvement in the herd conditions has been evident. If the dairymen can be induced to keep a record of the performance of a few cows in their herd, by weighing the milk and having it tested, other lines of improvement will soon be adopted.

With the continuation of the county agent system here, it would seem that we have at hand men who would be well qualified to direct and carry on this cow testing work.

And in connection with this cow testing work why not adopt a somewhat similar plan to one used by the Wisconsin State Dairymen's Association, that of recognizing and giving credit to records made by grade dairy cows? Few of our dairymen have purebred cows, but many good grade animals are scattered throughout the Island herds. Let us have a "Hawaiian Register of Production" in which the ability of grade dairy cows to produce large amounts of milk and butterfat can be recorded in official form, as is done with purebred animals. This "Register of Production" should include all cows producing 305 pounds or more of butterfat in 305 consecutive days. This "short year" will suit ordinary purposes better because it will enable us to keep up our best dairy practices, *i. e.*, have our cows produce a calf every year and give the cow four to six weeks' rest before parturition. The cows should be entered in the cow testing association for the entire period of their record, and have been tested by the official tester at least once a month. All tests should be guaranteed accurate by the owner of the cow, the tester, and the superintendent or director of the cow testing work. A certificate



could be issued for those animals which qualified and all data pertaining to the cows that have produced the required amount of butterfat could be given publicity.

This would do much to increase the value of high producing animals in our herds, would teach the dairymen the value of keeping records and stimulate them to use modern dairy practises on the cows which they already have. Improvement of dairy herds would soon follow here in Hawaii just as surely as it has done wherever these cow testing associations have been formed.

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## Eucalyptus Plantation

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*Report on the Experimental Plantation established in 1911 in Nuuanu Valley, Honolulu Watershed Forest Reserve, Oahu, Territory of Hawaii, by the Division of Forestry, Board of Agriculture and Forestry, in cooperation with the Forest Service, U. S. Department of Agriculture.*

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BY C. S. JUDD, *Superintendent of Forestry.*

### NATURE AND OBJECT OF PLANTATION.

This plantation of the 18 different species of eucalyptus trees, enumerated on the following list, was established in Nuuanu Valley, about 4½ miles from Honolulu, Oahu, Territory of Hawaii, at a point about 1000 feet northwest of the sharp turn in the road above Luakaha at an elevation of about 1000 feet above sea level. The first trees were planted in June, 1911, and the balance in March, 1912, all of the trees being set out 6 by 6 feet apart.

The object of this plantation, as set forth by my predecessor, Prof. Ralph S. Hosmer, who instigated the experiment, was "to secure data as to the habit, form, rate of growth and relative value under local conditions of species of eucalyptus supposed to be of economic importance, that are as yet but little known in Hawaii."

On account of the exposure to the strong trade wind sweeping down the valley, the rather excessive rainfall averaging about 175 inches annually, and the presence of a rank growth of Hilo grass, *Paspalum conjugatum*, which kept the ground, except in the very driest seasons, in a very boggy condition, the conditions for the best growth and development were not favorable and the trees in this experiment may be said to have undergone a very severe test.

## LIST OF TREES PLANTED.

Plot No.	Common Name.	Botanical Name.
1	Sugar Gum.....	<i>Eucalyptus corynocalyx</i>
2	Dwarf Box.....	" <i>microtheca</i>
3	Mountain Gum.....	" <i>goniocalyx</i>
4	Silver-leaved Ironbark.....	" <i>melanophloia</i>
5	Flooded Gum.....	" <i>rubida</i>
6	White Top.....	" <i>smithii</i>
7	Victoria Gum.....	" <i>leucoxylon</i>
8	Gray Gum.....	" <i>tereticornis</i>
9	Blackbutt.....	" <i>pilularis</i>
10	Narrow-leaved Ironbark...	" <i>crebra</i>
11	York Gum.....	" <i>loxophleba</i>
12	Mountain Ash.....	" <i>sieberiana</i>
13	White Gum.....	" <i>redunca</i>
14	Tallow Wood.....	" <i>microcorys</i>
15	Yellow Stringy-bark.....	" <i>muelleriana</i>
16	Tuart.....	" <i>gomphocephala</i>
17	Broad-leaved Poplar Gum..	" * <i>platyphylla</i>
18	Red Gum.....	" <i>rostrata</i>

In the original plantation plots 1 to 8, inclusive, were one-half acre each and plots 9 to 18, inclusive, were one-third acre each in size. Some of the last plantings in these smaller plots did not succeed at all and there was no evidence of them in 1916. For this reason they were left out of consideration in this examination and only the actual areas on which trees were found to be growing were taken. These are shown on the attached blueprint diagram of the plantation.

## MEASUREMENTS.

In 1916, five years after the trees were planted, breast height diameter and total height measurements were made of all of the trees in each plot. The diameters were measured in inches to the nearest inch with calipers and the total height to the nearest even foot with a long pole. Blanks were counted and added to the number of trees present to obtain the total number of trees planted and the success of planting. The volume was obtained by means of a locally constructed volume table and the results in cubic feet of wood including bark obtained for all the trees on each plot. For the sake of convenient comparison, the yield of each plot in cubic feet was converted to the equivalent yield in cords per acre, assuming that 70 cubic feet of this small-sized wood would equal 128 cubic feet of space, the outside measurements of a standard cord.

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\* In the original planting this was thought to be *Eucalyptus obliqua* but identification of the trees on this plot have proved them to be *Eucalyptus platyphylla*.

The results of these measurements, including the maximum total height in feet and the maximum diameter at breast height in inches, are given in the following table:

### EUCALYPTUS PLANTATION.

NUUANU VALLEY, HONOLULU WATERSHED FOREST RESERVE,  
OAHU, TERRITORY OF HAWAII.

#### SUCCESS, MAXIMUM GROWTH AND YIELD.

Plot No.	Name.	Planting Success.	Area Acres.	Max. hgt. Feet.	Max. D. B. H. Inches.	Yield. Cu. Feet.	Equivalent Yield, Cords per Acre.
9	<i>E. pilularis</i>						
	Blackbutt . . . . .	81	.26	34	6	82.12	4.51
16	<i>E. gomphocephala</i>						
	Tuart . . . . .	88	.35	34	6	88.78	3.62
15	<i>E. muelleriana</i>						
	Yellow Stringy-bark . . . . .	87	.23	38	5	56.68	3.52
12	<i>E. sieberiana</i>						
	Mountain Ash . . . . .	88	.35	38	6	83.77	3.42
14	<i>E. microcorys</i>						
	Tallow Wood . . . . .	73	.35	36	8	40.27	1.64
18	<i>E. rostrata</i>						
	Red Gum . . . . .	93	.22	28	6	23.27	1.51
1	<i>E. corynocalyx</i>						
	Sugar Gum . . . . .	84	.50	28	4	48.83	1.40
8	<i>E. tereticornis</i>						
	Gray Gum . . . . .	68	.50	34	5	34.89	1.00
10	<i>E. crebra</i>						
	Narrow-leaved Ironb'k . . . . .	83	.35	28	4	19.42	.79
3	<i>E. goniocalyx</i>						
	Mountain Gum . . . . .	85	.50	22	5	18.37	.53
11	<i>E. loxophleba</i>						
	York Gum . . . . .	75	.35	26	3	7.04	.29
13	<i>E. redunca</i>						
	White Gum . . . . .	47	.35	22	3	6.22	.25
17	<i>E. platyphylla</i>						
	Broad-leaved Pop. Gum . . . . .	61	.16	22	2	2.51	.23
5	<i>E. rubida</i>						
	Flooded Gum . . . . .	51	.50	20	3	6.31	.18
6	<i>E. smithii</i>						
	White Top . . . . .	69	.50	14	2	5.75	.16
7	<i>E. leucoxydon</i>						
	Victoria Gum . . . . .	47	.50	18	2	4.71	.13
2	<i>E. microtheca</i>						
	Dwarf Box . . . . .	64	.50	16	1	4.51	.13
4	<i>E. melanophloia</i>						
	Silver-leaved Ironbark . . . . .	39	.50	16	3	4.29	.12

On some of the plots the trees were mere spindling whips, hardly erect, and often sprawling over the tall grass. In others, where protection was afforded by small gulches, the growth was excellent and trees up to 8 inches in diameter and 38 feet in height were found. All varying degrees of growth between these two extremes were found. The majority of the trees had flowered and were found to be in fruit.

#### RESULTS.

From the foregoing table it will be seen that the best yield of wood was given by the Blackbutt, *Eucalyptus pilularis*, amounting to the rate of 4.51 cords per acre. This yield, while much better than that of any of the other plots in this plantation, on account of the adverse conditions mentioned above, is small and quite poor as compared with the yield of the Blue gum, *Eucalyptus globulus*, at Makawao, Maui, T. H., which, according to Margolin, as set forth on page 34 of Bulletin No. 1 of the Division of Forestry of this Board, "Eucalyptus Culture in Hawaii," at the age of five years ran as high as 15.1 cords per acre at an elevation of 4500 feet and 17.4 cords per acre at an elevation of 4200 feet but with a spacing of 12 x 18 feet and 12 x 15 feet, respectively.

For results to be expected, however, from the planting of trees of these species under conditions similar to this plantation, the data given in the foregoing table may be used as criteria.

#### NOTES ON PROMISING SPECIES.

The following notes, taken from standard works, on the eight species in this plantation yielding one cord per acre or more at the end of the first five years of growth, in the order of greatest yield, are presented for the information of those who wish to pursue the subject further.

1. BLACKBUTT. *E. pilularis*. One of the largest eucalyptus, which becomes a tree 100 to 150 feet, rarely 300 feet high and 3 to 5, rarely 12 to 15 feet in diameter. The wood is pale colored, strong and durable and one of the best for all around timber. The tree prefers a damp climate and moist, rich soil. It makes a rapid growth and is one of the best natural sprouters after the tree is cut.

2. TUART. *E. gomphocephala*. A small tree not exceeding 120 feet in height, yielding a wood which is heavy, hard and strong, very sound and possessing few or no defects. In fact, it is one of the strongest timbers in the world. It is used in ship-building and for bridge supports where great strength is required.

3. YELLOW STRINGY-BARK. *E. muelleriana*. A comparatively small tree, up to 70 feet in height, concerning which little is known. It has a yellow inner bark and a yellow stain



throughout the wood. The bark is stringy to the smaller limbs and branches.

4. MOUNTAIN ASH. *E. sieberiana*. A tree attaining a maximum height of 150 feet and diameter of 5 feet, which grows best in mountain regions. The wood is strong, light, tough and elastic, but is not durable. It splits easily and is suitable for inside work but is not durable when not protected from the weather.

5. TALLOW WOOD. *E. microcorys*. One of the bulkiest of Australian trees adapted to planting in humid regions and attains a maximum height of 300 feet and diameter of 10 feet. The wood is very durable and has a greasy texture which makes it suitable for ball-room flooring.

6. RED GUM. *E. rostrata*. A large tree, up to 250 feet tall and 14 feet in diameter, which is one of the best to resist wet tropical heat. The wood, which is very hard and dense, resists the teredo and termites and has unsurpassed durability.

7. SUGAR GUM. *E. corynocalyx*. One of the best all around trees which is suitable for a dry region. It attains a height of 150 feet and diameter of 5 feet. The wood is straight and even grained and is durable. Posts of this wood have lasted for 15 years in the ground. It is one of the strongest eucalypts and the seasoned wood is better than the best grade of second-growth hickory. The sweetish foliage attracts cattle and sheep which browse on the lower branches and seedlings.

8. GRAY GUM. *E. tereticornis*. A tree which grows to 150 feet in height and 6 feet in diameter and is usually found on humid flats. It can stand considerable drought but becomes stunted in rocky exposed localities. The wood is strong, hard, heavy and quite durable.

#### SUMMARY.

The experiment, while successful so far as actual tree survival is concerned, is surrounded by such adverse conditions that the different species probably do not show up to their best advantage in the way of growth and yield. The results, however, show that the Blackbutt has surpassed all of the others in growth, producing the equivalent yield of  $4\frac{1}{2}$  cords per acre in five years, and the tabulated yields of the other species show what may be expected from them under similar growing conditions.

It is planned to remeasure the trees on the plot in 1921, and thereafter every five years, so as to obtain complete figures on current growth and yield.

Honolulu, T. H., December 30, 1918.

# History of Botanical Exploration in Hawaii

By Prof. VAUGHAN MACCAUGHEY, College of Hawaii.

(Continued.)

## *Life of Asa Gray.*

Born at Paris, New York, Nov. 18, 1810; he died at Cambridge, Mass., Jan. 30, 1888. He was the son of a farmer, and was educated at Fairfield, (N. Y.) academy, and Fairfield Medical School. His botanical collecting and studies began in 1827. In 1831 he received the degree of M. D. In 1834 Gray was appointed botanist to the U. S. Exploring Expedition; he tired of the long delay in starting, and resigned in 1837. Gray's first textbook, the famous "Elements of Botany," was published in 1836, and won speedy recognition. In 1842 he was appointed to the Fisher Chair of Natural History in Harvard University, and he spent the remainder of his life at work there. He developed the now-renowned herbarium, library, and botanical gardens. Gray's most important work, the "Manual of the Botany of the Northern United States," was published in 1847. He retired from active service in 1873, and devoted his remaining years to research.

Brackenridge, the botanist of the Exploring Expedition, published his descriptions of the ferns collected during the voyage, as a separate volume. Unfortunately, the entire edition, with the exception of about a dozen copies, was destroyed by fire. A nearly complete set of his specimens is in the United States National Herbarium; the collection is also well-represented at the New York Botanical Garden.

The Rev. J. Diell, seaman's chaplain at Honolulu, aided Brackenridge materially in his collecting, and also did much independent collecting and research.

## 22. VISIT OF THE "GALATHEA" AND DIDRICHSEN.

1845-47.

On the "Galathea" Expedition which was sent out from Denmark Didrichsen was the botanist. The voyage occupied the years 1845-1847, and a visit was made to the Hawaiian Archipelago. The larger portion of Didrichsen's collections are now in Copenhagen, although exchanges occur in other European herbaria.

## 23. THE VOYAGE OF THE "HERALD"; SEEMANN.

A British expedition sailed in the "Herald," and from 1847 to 1851 cruised the world, visiting the West Indies, Central and

South America, and Arctic regions, the Hawaiian Islands, and South Africa. Berthold Seemann, whose name will always be associated with the botany of the Pacific, was a member of this expedition.

He was born in Hanover, Germany, 1825, and died in 1871. In 1852 he published a "*Narrative of the Voyage of the Herald*"; in 1853 he founded the botanical periodical "*Bonplandia*"; in 1860 he made an extended visit to the Fiji Islands; in 1864-1866 he explored Venezuela and Central America. From 1864 to 1871 "*Bonplandia*" was continued in England as the "*Journal of British and Foreign Botany*." He was the author of numerous botanical and geographic publications. Most of the references in Hawaiian botany are to his monumental "*Flora Vitiensis*."

#### 24. EXPLORATIONS OF JULES RÉMY.

Jules Rémy, the famous French traveller and botanist, visited the Hawaiian Islands twice during his extensive travels around the world, 1851-1863, and made notable collections of the Hawaiian flora.

##### *Life of Rémy.*

Rémy was born near Chalons-sur-Marne, Sept. 2, 1826; died Dec. 5, 1893. He early manifested a passion for natural history, and upon the completion of his schooling occupied the chair of natural history in Rollin College, 1848-1851. In 1851 he began a journey around the world, visiting the Canaries, Brazil, Chile, Bolivia, Peru, the Marquesas, the Paumotu, Tahiti and Hawaii.

##### *Hawaiian Experiences.*

The following account of his Hawaiian adventures is taken from the *Nouvelle Biographie Générale* (Paris, 1896):

"Il consacra trois années à l'exploration des îles Sandwich, dont il s'est fait plus tard l'historien, et recueillit de nombreux matériaux destinés à éclairer ses études non-seulement sur la botanique, mais encore sur l'histoire, l'ethnographie et la linguistique. Un cruel incident faillit alors l'arrêter dans ses investigations scientifiques. Durant une de ses excursions, un indigène fanatique lui administra à diverses reprises du poison. La vigueur de sa constitution lui permit heureusement de résister à ces odieuses tentatives, et il acquit même alors une réelle influence politique sur les destinées du pays. Le roi Kamehameha III l'avait pour l'attacher à son gouvernement. De l'Océanie M. Rémy se dirigea sur la Californie, et la parcourut en compagnie d'un Anglais, M. Brenchley, dont il avait fait la connaissance à Hawaii."

Rémy went from California to Salt Lake City, spent three

months among the Mormons, and then continued his travels into Mexico, and South America. There he visited the Peruvian Andes, Bolivia, and Chile, and returned to the United States from Panama. He returned to France, and prepared his observations and records for publication.

He later made a second tour, visiting India, Thibet, China and Japan, terminating with a second visit to the Hawaiian Islands. His publications relating to Hawaii are:

Ka Moolelo Hawaii. Histoire de l'Archipel hawaiiien (îles Sandwich), texte et traduction, précédée d'une introduction sur l'état physique, moral et politique du pays. Paris, 1862.

Recits d'un vieux sauvage pour servir à l'histoire ancienne de Hawaii. Chalons-sur-Marne, 1859.

Rémy's Hawaiian collections and botanical labors are commemorated in the names of many indigenous plants: *Coreopsis Remyi*, *Carex Remyi*, *Lipochaeta Remyi*, *Lysimachia Remyi*, the genus *Remya*, *Schiedea Remyi*, *Sicyos Remyanus*, *Tetramolopium Remyi*. Rémy's collections (1851-55) are in the Paris Museum; a portion of his herbarium is now in the Gray Herbarium at Harvard University.

## 25. THE BOTANICAL EXPLORATIONS OF MANN AND BRIGHAM.

In 1864-65 Horace Mann, the son of the renowned Horace Mann, and William T. Brigham, another botanical student in Harvard University, visited the islands and made extensive botanical explorations. Dr. Brigham states, "When Dr. Asa Gray was told that I was soon to visit the Hawaiian Islands, he asked me to collect the very peculiar flora of that group, and suggested the propriety of asking Horace Mann to accompany me. It was a short notice, but his friends advised him to go, and he joined me in California. . . . With his rich collections he returned to Cambridge, and was soon appointed Dr. Gray's assistant, and afterward instructor in botany in Harvard College." His enthusiasm for his science led to overwork, and not long after his return he died of hasty consumption.

Mann's botanical publications were as follows:

1. Revision of the genus *Schiedea* and some of the Rutaceae, Proc. Boston Society Nat. Hist., Vol. 10, 1866, p. 309.
2. Enumeration of Hawaiian Plants, Proc. Amer. Acad. Arts & Sci., Vol. 7, 1867, p. 143.
3. Flora of the Hawaiian Islands, Proc. Essex Institute, Vol. 5, 1867.

William Tufts Brigham was born in Boston, 1841; received the A. B. degree at Harvard, 1862, and the A. M. in 1865; explored the Hawaiian flora, 1864-65; was admitted to the Massachusetts bar in 1867; was instructor in botany at Harvard, 1868-69; and since 1888 has been director of the Bernice Pauahi Bishop Museum in Honolulu.

The botanical work of Mann and Brigham is commemorated



in such names as *Hesperomannia*, *Brighamia*, *Pelea mannii*, *Bo-bea mannii*, *Cryptocarya mannii*, *Cyanea mannii*, *Gahnia mannii*, *Asplenium mannii*. One set of their collections is at the Bishop Museum, in Honolulu; another is at Cornell University.

## 26. EXPLORATIONS BY WAWRA.

In 1869 the islands were visited by the Austrian East Asiatic Exploring Expedition in the frigate "*Donau*." The botanist of the expedition was Dr. Heinrich W. Wawra, Ritter von Fernsee. Owing to protracted repairs to the vessel at Honolulu, Wawra availed himself of the opportunity to make extensive explorations in the various islands, and collected a large quantity of botanical material.

### *Life of Wawra.*

Wawra was born at Brunn, in 1831; he died in 1887. He studied medicine, but was early attracted by botanical work, and made numerous expeditions to various parts of the Old and New Worlds. The Austrian Exploring Expedition, in which he was engaged, sailed Oct. 18, 1868, and was out two years and four months. The frigate visited Messina, Carthagen, Tangiers, Madeira, Teneriffe, Cape Town, Java, Singapore, Bangkok, Saigon, Hongkong, Shanghai, Peking, Nagasaki, and Yokohama. Then, to quote the biography given in the *Allgemeine*:

### *In Hawaii.*

Deutsche Biographie, (Leipzig, 1896) .... "ostwaerts durch dem stillen Ocean nach Honolulu. Der Ausenthalt auf den Hawaiischen Inseln war kein frei williger. Ein furchtbarer Cyclon beschadigte die Fregatte so, das sie hier Zuflucht suchen musste. Es dauerte 4 Monate bis das Schiff wieder seetuechtig wurde und Wawra benutzte die Zeit zu einer gruendlichen Durchforschung der Insel gruppe, so das dieser Theil durchreisten Gebiets nach der botanischen Seite hin den groessten Erfolg hatte." The voyage continued to Callao and other South American ports, and reached home March 1, 1871.

The fruits of Wawra's Hawaiian studies appeared in his "*Beitraege zur Flora der Hawaiischen Inseln*" in the *Zeitschrift Flora*, vols. 55-58, 1872-1875. In 1873 he began another journey around the world, and stayed for a short time in Honolulu.

The researches of Wawra are indicated by a large number of new species named by him, and by plants named in his honor: *Acrostichum Wawrae*, *Cyrtandra Wawrae*, *Pelea Wawraeana*, and the genus *Neowawraea*.

(To be continued.)

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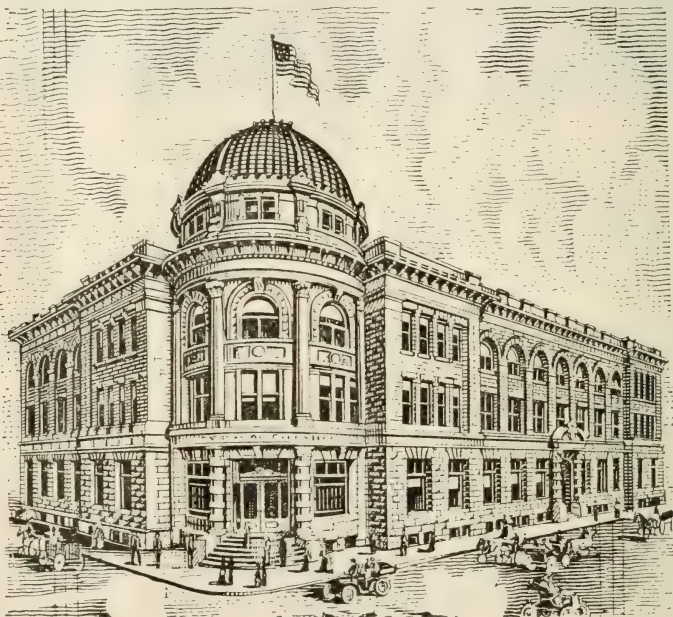
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

FEBRUARY, 1919

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# The Hawaiian Forester and Agriculturist

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and Agriculture.

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# Board of Agriculture and Forestry

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The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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No. 2

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## The Territorial Fair

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FITTING CATTLE AND HOGS FOR SHOW PURPOSES.

By PROF. RALPH J. BORDEN.

It is not too early for the intending exhibitor at the 1919 Territorial Fair to begin to look over his animals and choose those he intends to exhibit. Many animals that are to come in from the range will need considerable time before they are ready for the judge. If breeders will begin now to get their show animals into condition, they will save themselves much of that "last minute rush" which was noticeable at our first fair, and the attractiveness of the livestock exhibit will be greatly improved.

The first thing to do is to select the right kind of individuals. Keep in mind your breed type and select those animals whose conformation agrees closest with the standard. Look at the feet and legs of your prospect. They must be straight and nicely set under the body, and show no coarse or rough joints. See that there is no depression behind the shoulders which would indicate a narrow heart girth. Pick out the individual with a long, deep, well-sprung barrel and a broad, level, strong back which is well carried out to the tail head. Be sure that your animal has that alertness and grace to its carriage which makes it attractive. And there isn't time now to fool with an animal that is not in perfect health.

Any animal that is to go into the show ring should be presented there at its best. A fairly good animal may often be so fitted as to win over a better animal not as well fitted. The value of first impression cannot be over emphasized. The judge, the buyer, the public find it difficult to forget the first impression that is made upon them when they see an animal enter the show ring.

To fit an animal properly requires time and patience, yet no breeder can afford to go to the expense of making an exhibit unless he gives some attention to this work.

Probably the most important factor in fitting live stock is

exercise. If animals are not properly exercised, they lose their appetite and become sluggish, under which conditions it doesn't take long for them to lose flesh. Cattle may be turned out at night in large pastures. When possible, they may be led by a halter, which will make them easy to handle before the judge. Hogs should be compelled to walk from a quarter to half a mile a day.

Next in importance is feed. Both cattle and hogs should be so fed as to be well filled out. This makes them look larger and more vigorous. They should not be overfat, for then judges will often discriminate against them. A variety of foods should be used in the rations in order to stimulate the appetite. Succulent feeds and bulky grains should make up a large part of the rations until a few weeks before going to the fair, when the succulent feed should be reduced in order to get the animals on to the hay and grain which will probably be fed on the fair grounds. Beet pulp, ground oats, wheat bran and linseed meal are good feeds to use in fitting show cattle. Corn chop and tankage or wheat bran, rolled barley and linseed meal will put the bloom on hogs. The feeding should be done at regular intervals, the animals being given only what they will eagerly clean up. Any left over feed should be removed before new is given. If an animal loses her appetite or gets fussy about her feed, take it away from her and wait until she is hungry. Watch the digestive system and, in case of constipation, give cattle a dose of raw linseed oil and hogs a dose of epsom salts.

From four to six weeks before the fair opens, cattle should be brought into the barn. They should be thoroughly washed to remove all dirt. Those with thick, shaggy coats should be clipped. During the daytime, they should be kept out of the bright sun. Light blankets should be put on in order to make the skin soft and pliable, keep it clean and give the hair a good luster. Daily grooming is now necessary as this will stimulate the oil glands in the skin and make the hair sleek and glossy. Cattle should not be washed too frequently, as this will remove the natural oil from the hair. After grooming, go over the animal with an oily flannel or woolen rag to make the hair stay down and give an additional gloss to it. If the animal has horns they too should be made attractive. Use a rasp to get the scaly part off, and then scrape the entire horn with a steel scraper. Later use emery cloth and finish by rubbing the horn up with an oily flannel rag. The hoofs should also be trimmed and rubbed up with an oiled rag.

Hogs should also be kept away from the bright sun and given an occasional washing during the month before fair time. Their feet may need trimming so they will stand squarely on their toes and they should be gone over thoroughly at stated intervals with a light oil and stiff brush.

Before starting for the fair grounds see that you have your own tools and equipment to care for your animals while there.





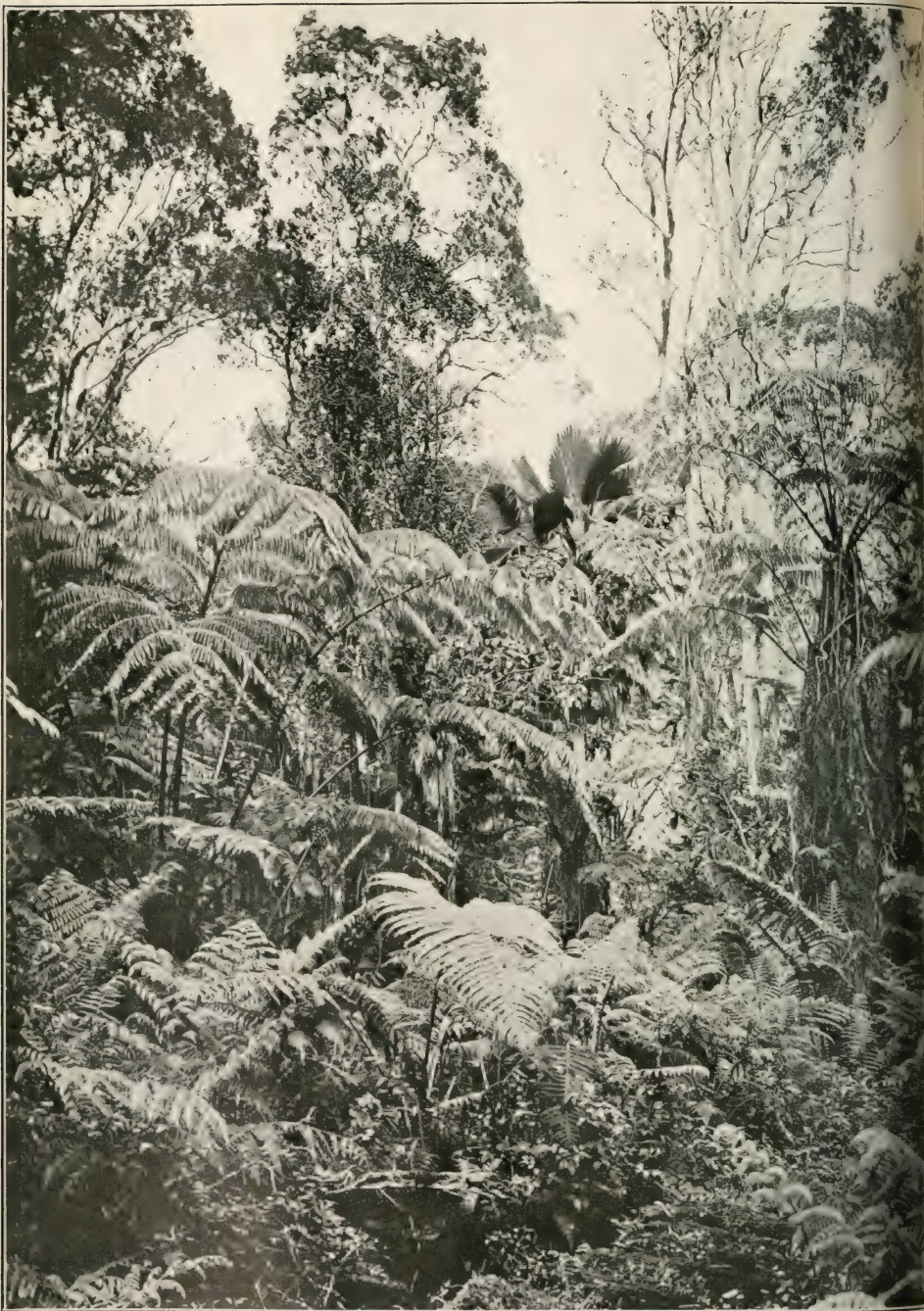


Fig. 1. Forest Reserve at Kulani, near 28 miles, Hawaii. A mixed rain forest type showing new native palm, *Pritchardia Beccariana* Rock.

Don't expect to borrow a fork or brush from your neighbor. Take along enough help to handle your exhibit and see that they are supplied with information about your animals that visitors to your exhibit may want. Don't forget to put into your equipment box a pair of hand clippers, some good brushes, pieces of woolen cloth, a little oil and a good knife. Plan to arrive at the fair grounds two or three days before the fair opens so as to give your animals a chance to accustom themselves to their new surroundings before the visitors begin to come. Get your entry tags from the superintendent as soon as you arrive and see that you understand all of the exhibitors' rules. Bed your stock well and see that it is comfortable before you leave it for its first night in new quarters.

On the day when the animals are to be judged, go over them carefully to see that they are prepared. Get them into the ring promptly when your class is called and hold your animal in such a way that it shows up to best advantage. Keep your eyes on the judge, never getting between him and your animal. Don't volunteer information about your entry unless it is asked for. Be a good sportsman and accept the judge's decision as if it pleased you.

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## One Government Forest

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### RESERVE LANDS AT KULANI, HAWAII, DESCRIBED.

By JOSEPH F. ROCK, Consulting Botanist.

The whole forest reserve area at Kulani, Hawaii, is covered with a decidedly uniform and, geologically speaking, rather young forest. The border below 29 Miles contains more of a mixture of trees than the area further up toward Kulani proper. Near 29 Miles we find that trees are more numerous, especially ohia lehuas with occasional mana trees, *Xylosma Hillebrandii*, of which the writer encountered large individuals. Dispersed throughout that region is a very beautiful native fan palm with large orbicular fruits described by the writer as a new species under the name of *Pritchardia Beccariana*. Olapa, *Cheirodendron Gaudichaudii*; an occasional aiea, *Nothocestrum*; kopiko, *Straussia*; olomea, *Perrottetia*; pilo, *Coprosma*; and manono, *Gouldia*, form the rest of the arborescent growth.

The forest is, however, mainly a tree-fern forest interspersed with an occasional tree of the species mentioned. An acre of this forest land may contain perhaps five or six mature trees, of which four may belong to the genus *Metrosideros* (ohia lehua). The remainder is all tree ferns composed of the two common types—*Cibotium Chamissoi* and *Cibotium Menziesii*. Undergrowth is mainly composed of *Cyrtandrae*, *Broussaia*.



*Cyanea tritomantha*, *Cyanea pilosa*, *Rubus*, *Phyllostegia*, etc. Ferns are of course very numerous. The whole forest is in splendid condition, but the undergrowth is much disturbed by the ravages of wild pigs. The uniformity of the forest makes exploring rather uninteresting for a botanist.

Kulani proper is a densely wooded volcanic cone, the forest being exceedingly uniform and of the rain forest type. Palms are entirely absent. A gap was cut at the summit to permit a view of the surrounding region. The land toward Keauhou lies considerably lower than that over which Kulani was approached, or, in other words, the slopes of Kulani towards Keauhou are rather steep, giving the cone quite a formidable appearance both in height and size. The summit appears as two cones, but in fact the central valley or ridge, densely wooded, is nothing but an ancient volcanic fissure dividing the cone in two. The ground is covered with fallen trunks of both trees and tree-ferns which are covered with numerous epiphytes such as ferns *Stenogyne*, *Clermontia parviflora*, *Astelia veratroides*, *Selagruella*, *Lycopodium*, etc. The soil is mostly black loam, and the ground quite hummocky, which, besides fallen trunks and the absence of a trail, made progress quite slow. If properly fenced and protected from cattle and wild hogs, this forest reserve is certainly one of the finest on Hawaii, and deserves protection from cattle and hogs.

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## For the Farmer

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### CORN AT THE COLLEGE OF HAWAII FARM.

By PROF. L. A. HENKE.

In view of the importance of corn as a food crop and the rapidity with which it can be grown, special efforts were made to develop or find a variety which would prove a sure crop on the low lands of this Territory. On the Island of Kauai a variety of Guam corn has been grown with much success, and the higher elevations of Maui and Hawaii produce splendid crops of corn every year. But on the lower lands of this Territory the probabilities of failure were greater than those of success when growing the ordinary corn belt varieties of corn. The usual behavior is for the corn plant to grow to a height of about one to three feet when elongation of the stem seems to cease, resulting in the leaves being bunched at the top, the leaves likely are variegated in color (stripes of light green running horizontally through the leaf), some leaves become distorted in shape with corrugations running perpendicular to the long axis of the leaf, and before long the leaves begin to turn white and die. The plant seemingly realizing that death is near, makes a last feeble effort to reproduce itself; the flowering tassel is sent up though the plant may be only a foot tall,



Fig. 2. Tree Ferns in the Forest Reserve near Kulani, Hawaii.









following which the feeble struggle against adverse conditions is over and the plant dies. Occasionally such a diseased plant may survive long enough to produce something of an ear, but this is unusual.

Just what these adverse conditions are in a region of favorable temperature, sufficient moisture, plenty of sunshine and apparently good soil is still something of an unsolved problem. The leaf hopper is undoubtedly a big factor, for stunted plants are almost invariably covered with leaf hoppers, but whether the hoppers are the primary cause or merely come on after the plant has been weakened by other causes is still unknown. The work at the college has been along the line of trying out various varieties of corn from different parts of the world, and among these varieties some seed corn obtained from Cuba has given by far the most promising results. The results of tests of different corn varieties is briefly given below.

#### JUNE CORN.

This corn was obtained from Mr. Ernest Romberg of Muldoon, Texas, where it is locally known as June corn. Mr. Romberg reported that it matures in 110 days in Texas, and that it is probably of Mexican origin. It is a white dent corn with some ears showing decidedly flinty characteristics. The ears averaged 84.7% kernels. The corn was planted December 30 and harvested April 23, making the time of maturing 114 days. Some stalks grew to a height of 6 feet, but many were only two feet tall, and showed the peculiar characteristics described above as being common to most corn belt varieties when grown on the lowlands of Hawaii. The yield was very poor—only 11.8 bushels on an acre basis. The husks have a great tendency to open before the corn is harvested, which results in many of the ears being infested with the larva of the grain weevil while still in the field, in addition to the loss due to birds eating the exposed tips of the ears. The leaf hoppers were not particularly abundant on this field, probably due to the good work of the 300 leaf hopper parasites liberated in this field on January 25 by Mr. E. M. Ehrhorn and Mr. D. T. Fullaway of the Board of Agriculture and Forestry.

While this variety of corn can not be considered a success from this test the fact remains that it proved better than anything else we tried with the exception of the Cuban and Guam varieties to be reported later.

#### NEW ERA YELLOW DENT CORN.

This corn was developed and grown with a great deal of success by Mr. F. G. Krauss at a substation of the Hawaii Agricultural Experiment Station located at Haiku, Maui, at an elevation of about 600 feet.



Two plantings of this corn were made on the college farm, one on January 30 and the other on February 27. The behavior in both cases was the same. When the corn was about one to two feet tall the leaves became distorted in shape with light green stripes and the flowering tassel was put forth. Only a very few stalks attained a height of four feet and none produced mature ears. Many plants started ears, however, and these were about half developed when the plant died. Leaf hoppers were very abundant.

#### GERRICK PROLIFIC CORN.

The seed of this variety was obtained through the courtesy of Mr. C. P. Hartley of the Bureau of Plant Industry of the U. S. Department of Agriculture. It is described as being a long season prolific type of corn grown largely in the South-eastern and Gulf States.

We planted the seed on February 1, and it grew fairly well for seven weeks, when the plants began to develop the typical characteristics described above. Tassels were produced even though the tallest stalks were only 3 feet in height. Leaf hoppers were very abundant. No ears were produced by this variety.

#### LAGUNA CORN.

This seed was obtained from the U. S. Department of Agriculture and planted March 24. Leaf hoppers were very abundant from the beginning and by June 8, 75% of the plants were dead. However, the balance of the plants struggled along, and by July 9 had matured a few ears—105 days after planting. The yield on an acre basis was practically nothing—3½ bushels, but even this low yield makes this variety rank next to the June corn.

#### BRAZOS WHITE CORN.

This variety, which is a cross between Boone County White and a Laguna variety, was also obtained from the U. S. Department of Agriculture. It was planted on May 4 and though leaf hoppers were present from the start it made a normal growth till the plants were about three feet tall. Then the characteristic diseased condition came on very rapidly, the plants began to die, and no ears were produced.

#### UPLAND MEXICAN CORN.

This corn was obtained through Prof. D. L. Crawford from the Department of Agriculture of Mexico. It is a white variety with a deep shoepeg type of kernel. It was planted on April 25 and grew nicely till about fifteen inches tall—rather slender plants with a decidedly bluish tinge to the color of the leaves,

Then it began to fail rapidly and never produced ears. The best plants never grew taller than three feet. Leaf hoppers were abundant, but a field of Cuban corn adjoining this and planted on the same day grew to an average height of six feet and produced a good yield of ears.

#### GUAM CORN.

This variety has been grown very successfully on the Island of Kauai for some years. It is a large kernalled white variety. Two plantings of this corn were made on the college farm, one on December 20 and the other on January 4. Both fields showed the same characteristics. Both fields had leaf hoppers present, but only about 5/10% of the stalks showed abnormal conditions in manner of growth. On the college farm this variety attained a height of only five feet, but the wind conditions during the entire growing season were rather unfavorable; heavy winds often following rains which first loosened the soil, and the corn withstood these adverse conditions very well. The December 20 planting matured in 125 days and yielded 24.1 bushels, and the January 4 planting matured in 129 days and yielded 25.2 bushels on an acre basis. The husks tend to open before the ears are mature, permitting injury by birds and by the larva of the grain weevil, and the plants showed a tendency to send up as many as four or five suckers at the base of each plant. However, these are minor factors compared with the tendency of many varieties not to produce anything, and Guam corn must be considered one of the good lowland varieties of corn for Hawaii.

#### CUBAN CORN.

Cuban corn has been the outstanding corn of all the varieties that we tried on the college farm. The original seed was obtained from Cuba through the Crenshaw Bros. Seed Co. of Tampa, Florida, in January, 1917. As corn belt standards go it would have to be considered an inferior appearing corn. The kernels are rather shallow, some are dented and others show a decidedly flinty character. The color is dark yellow, which meets with approval, for the Honolulu market is decidedly partial to a yellow corn. The average weight of the original ears was .46 lb. each, consisting of 77% kernels and 23% cobs. The following table shows the results we have obtained with the different trials of this variety.

Date of Planting.	Date when ready to harvest.	Days required for maturing.	Yield in bushels (70 lbs.) acre basis.
Feb. 13, 1917	June 8, 1917	115	30.6
Aug. 23, 1917	Dec. 19, 1917	116	41.1
Oct. 17, 1917	Feb. 14, 1918	117	57.4
Oct. 17, 1917	Feb. 13, 1918	116	55.6
Oct. 25, 1917	Mar. 2, 1918	127	50.1 <sup>1</sup>
Feb. 26, 1918	June 25, 1918	119	9.0 <sup>2</sup>

<sup>1</sup>This field was badly infested with the Japanese "nut grass" (*Cyperus rotundus*) which formed a sod and undoubtedly retarded the time of maturing.

<sup>2</sup>When this stand of corn was about 15 inches tall a three-day strong wind following a heavy rain nearly blew the corn out of the ground and some never did recover, and after this wind all proved more susceptible to hopper attacks than any other Cuban corn field we had.

Cuban corn does not possess an absolute immunity to the leaf hopper, but in most cases a marked resistance. Various soil and weather conditions seem to greatly influence its ability to withstand the leaf hopper. All our fields had leaf hoppers in them, but in only a few cases did they seem materially to decrease the yield. There were occasional plants in all of our Cuban corn fields which showed the stunted condition characteristic of the varieties which were total failures, but these stalks, except in the case of the field planted February 26, 1918, were never abundant enough to seriously reduce the yield.

Aside from this valuable apparent resistance to the hopper the husks surround the ear so completely and tightly that there never is any bird or weevil injury in the field even if it is not harvested till long after it is matured. In a country where the grain weevil is so common as in Hawaii this is an extremely valuable characteristic. With husks that open at the tip before maturing it is a common experience to find ears that are rotten with the larva stage of the weevil when harvested.

Seed of this corn has been distributed by the college to 101 corn growers in every part of the Territory of Hawaii. Some reported failures, others reported remarkable success; most of them failed to make any report. The following are a few comments:

"This is the best corn I have ever planted. It is weevil proof. My corn is 7½ to 8½ feet high." Lawrence Maioho, Koloa, Kauai.

Principal E. A. Brown of Puunene School, Puunene, Maui, in reporting a yield of 31.5 bushels makes this comment: "Kula corn planted about the same time was a total failure. It took on a streaked appearance when about half grown and failed to make further development. Planted in December it did very well."

Mr. George E. Lake of Hana, Maui, makes this comment:

"My corn was a great delight. A wonder in the neighborhood. It grew very rankly. Some ears were four and more feet above the ground. Some of the best ears I have saved for seed. Many of the people have asked me for seed. No other corn has ever made a success of it in our section, in any way comparable with this. I shall plant earlier this year, it may be in September. We have great rains and high winds in the winter months. Gardens are thrashed into tatters and washed into the sea. Many pilikias" (troubles).

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## "THE HEAD OF THE HERD."

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By PROF. RALPH J. BORDEN.

Too many of our farmers who have purchased bulls for their herd sires have been disappointed in the results obtained, and in most cases this disappointment has been the fault of the purchaser rather than the bull. Most of us prefer to buy a young bull rather than an old one, and I believe that farmers in Hawaii are justified in this preference. An old bull, even though he is a proved sire and has his mature development, is expensive to transport, difficult to handle with our transportation facilities, and has not the period of usefulness ahead of him that a young bull has. The young bull on the other hand can be purchased and transported more cheaply. He is easier to handle and can be trained and developed as we wish. If he proves valuable he has a long period of usefulness ahead of him. There is also less chance of bringing disease into our herd with a young bull that has not been in service. However, it is not enough for one to select a fine bull calf, that has excellent individuality and ancestral backing, and expect him to grow into a fine herd sire without good care and attention. Neglect in feeding and handling when he is young will result in improper development and unsatisfactory results, but, given half a chance, he will not often prove a failure.

From the day he is born, a bull calf intended for a herd sire should be kept growing and not allowed to become stunted. During the first six months of his life there is no better food for him than milk. This should be fed warm to him from a bucket. During the second month skim milk may be gradually substituted for whole milk and from fifteen to twenty pounds fed in three feeds should be allowed. He should be taught to eat grain as early as possible. Rub a little on the end of his muzzle after he has had his milk and he will soon learn to eat it. Give him only a small handful at first, and increase it grad-



ually as his appetite increases. A grain mixture of three parts ground oats, three parts of wheat bran, and one part oil cake meal makes a good ration. Give him access to some fine alfalfa hay. Nothing is better for the development of his frame. Let him have the run of a small pasture where there is good pasturage, or, in lieu of this, furnish him with some fresh green alfalfa daily. Remember that a young growing bull likes to have his belly full all the time and consequently must have hay or green fodder where he can eat when he wants to.

Allow him plenty of exercise. Don't keep him penned up too closely while he is young. Teach him to lead by a halter and show him his master at an early age. Look out for lice on his body. If they appear in great numbers they will sap his vitality. An occasional washing with a coal tar disinfectant will keep them under control. Provide him with a good shed closed on three sides, so that he can get out of windy, rainy weather. If there are no trees in his pasture, he will use this shed as a protection against the hot sun also. Never allow anyone to tease or fool with him. Furnish him with fresh clean drinking water.

After he is six months old, he should be kept by himself and not allowed to run with the heifers or rest of the herd. The feeding of milk can be discontinued but he should get from two to four pounds of grain daily, together with all the alfalfa hay and green fodder he will clean up.

When he is a year old, he should have a ring put in his nose, and he should thereafter be led by a staff. Never trust him at any time, even though he appears harmless, for it is the "gentle" bull that is most usually the cause of some obituary notices.

I should not advise the use of a bull under a year old, for service, even though he be well grown and vigorous. It is a safer plan to wait until he is a year old, so as not to retard his growth. During his first year in service, he should not be used much oftener than once every two weeks, and never be allowed to serve a cow more than once. He must still be kept vigorous and growing, and forced to take exercise if he is to reach maturity in prime condition. If he has been properly fed and handled during his first two years, he will be valuable for many more.

When mature, care must be taken not to overfeed him. Age gives him a tendency to become lazy and put on fat easily, both of which impair his usefulness. Give him simply enough grain and roughage to keep him in vigorous condition, but not enough to allow him to get fat. Exercise him daily, because if he gets lazy he is not a sure breeder. Keep him in sight of the herd, but separated from it by a strongly constructed fence. Use a little common sense in the way he is handled and used during his reign as the "head of the herd."

## Concrete Fence Posts

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The following directions for fabricating reinforced concrete fence posts are given by Mr. H. G. Groves in the New Zealand Journal of Agriculture of December 20, 1918, and are repeated here briefly for the benefit of the readers of the Forester who have cause to construct fences of a lasting character.

Clean sharp gravel with plenty of sand in it is required for making concrete posts. The gravel should not be coarse and for best results no stone in it should be larger than a walnut.

The mould should be 5 in. by 4 in. at the bottom, 4 in. by 4 in. at the top, and 6 ft. 3 in. long, inside measurements. Cut the sides of the mould 6 ft.  $3\frac{3}{4}$  in. long, bottom end  $8\frac{1}{2}$  in. long, and top end  $7\frac{1}{2}$  in. long; all timber being 4 in. wide. Mortise the sides into the ends  $\frac{3}{8}$  in. deep, allowing 1 in. outside of mortise each side of the mould. This saves splitting when nailing together. Use 1 in. timber for the ends, and  $\frac{3}{4}$  in. timber for the sides. Nail the sides and ends together, lay on a board, tack a cleat on either side of the mould and hold it in position, and it is then ready for use. The timber should be planed smooth for the inside of the mould and the mould should be wet when the concrete is poured in.

Use five parts of gravel to one of cement. Five buckets of gravel and one of cement make three posts and a little over. Turn over the gravel and cement in the dry state, then water and turn twice or more while wet. Do not apply too much water to the mixture at first. Dampen and then keep adding water as the turning proceeds until the mixture is the consistency of mush. It is better to have the mixture too wet than too dry, since it is then more easily puddled in the mould and sets better. If the mixture is too wet the water in it comes to the top as it is being worked into the mould and runs over the sides, taking cement and fine sand with it, which means wasted strength. A few mixings will give the experience required to know when the mixture is about right. A bricklayer's trowel and a plasterer's float are all the tools required for working the concrete in the moulds; any handy man can make the float.

Put 2 in. of concrete in the mould and puddle well, using the float to pack it tight, especially into the corners, then work the trowel along the sides and ends. Doing this works the fine material out to the sides and makes a smooth and even surface on the posts. For reinforcing now lay two wires cut the length of the mould on top of the concrete, and fill the mould a little overfull. Push two more wires into the concrete, puddle well, being particular to work the trowel along the sides and ends, then finish off by working the trowel along the top of the mould to remove surplus material. In place of the last two wires a

piece of piping or an old fencing-standard makes a good reinforcement.

For fixing the wires to the posts several methods may be used. First is the method of holes through the posts made by inserting small-sized pieces of piping. For a new fence on level ground this way would possibly be satisfactory, but on hilly fence-lines it would be impossible to pull the wires through the posts owing to the wires locking on the edge of the holes at the dips and rises. Another method is to put two wire loops in the concrete for each wire, and thread a piece of wire down from the top of the post to hold the wires in position. The time taken in making the loops is a great drawback to this method. A better way is to put  $6\frac{1}{4}$  in. by  $\frac{3}{8}$  in. bolts into the posts, one 5 in. from the top, the other 3 in. above the ground-level, for the purpose of bolting a 4 in. by 2 in. batten to the post. This allows the wires to be stapled to the posts in the ordinary way. Put a saw-mark on the moulds where the bolts are to be put in, so that all posts have the bolts in the same position. By doing this the battens are interchangeable. The bolts should be pushed into the concrete the full depth of the mould, taking care to keep them upright and in the center of the posts. They are best put in after the mould has been filled with concrete and smoothed off.

For posts to be used as dips in the fence-line and requiring a foot, make a hole near the bottom of the post by putting in a piece of 1 in. piping, taking this out two or three hours after the post is made, by turning the piping around and pulling gently at the same time. Extra wire should be put round the bottom of posts that are to be used for dips. It is doubtful if concrete posts will stand the strain of the wires in a heavy lift, but they do quite well for light places.

Do not take the posts out of the moulds for a month after making—wetting them occasionally during that time—and leave them six months to season before using.

A bag of cement makes seven posts and a little over, two bags of cement making fifteen posts.

The weight of concrete posts is their chief disadvantage—each post weighing about 130 lb.; but they can be used where haulage is easy, leaving any timber available for use on rough back lines.

C. S. J.

# History of Botanical Exploration in Hawaii

By Prof. VAUGHAN MACCAUGHEY, College of Hawaii.

(Concluded.)

## PERIOD IV. THE LATTER PERIOD.

### 27. WILLIAM HILLEBRAND, HAWAII'S GREATEST BOTANIST.

As has been evident from the foregoing discussion, most of the botanists who visited the Hawaiian Archipelago made but comparatively brief stays in the Islands, collected in a few places, and then worked up their material at leisure in places far remote from the Pacific. The one man who made a prolonged residence in the Islands, and a thorough survey of the entire flora, was William Hillebrand.

#### *His Life.*

He was born in Nieheim, Westphalia, Nov. 13, 1821. His education was of the typical German kind, terminating in university studies at Göttingen, Heidelberg, and Berlin. He studied medicine, and began his practice in Paderborn, a town near his birthplace. A serious lung disease forced him to leave his native country, in search of a more favorable climate. He sailed to Australia, and after a brief stay there moved to Manila. The climate of the latter place was distinctly unfavorable, and he was soon compelled to renew his search for health. In a very serious physical condition he engaged passage on a brig bound for San Francisco. He was much benefited by his stay in California, and from there he returned to Hawaii, where he had touched on the east-bound voyage.

#### *Botanical Studies.*

In Honolulu he entirely regained his health, and he made that city his home for a period of twenty years. He was an enthusiastic botanist, and visited all parts of the islands in search of material. He surrounded his home in Nuuanu Valley with beautiful gardens, which have remained famous to this day as "The Hillebrand Gardens." These are filled with choice exotics from all parts of the tropics, and contain many rare specimens to be found in no other parts of the islands. Dr. Hillebrand was active in many responsible positions. He was physician for the Queen's Hospital and the Insane Asylum; an active member of the Board of Health and the Royal Hawaiian Agricultural Society; a member of the Privy Council of King Kamehameha V, and his private physician.



In 1865-66 he made an extended trip to China and the East Indies as Commissioner of Immigration for the Hawaiian Government, and discharged his difficult duties with great ability. He also made large plant collections during this trip, and introduced many valuable plants into the Hawaiian Islands.

In 1871 he left the islands, and during the remainder of his life resided in various parts of Germany, Switzerland, Madeira, Teneriffe, etc. He was seriously ill for two years before his death, which occurred in Heidelberg, July 13, 1886. (\*) His large herbarium was bequeathed to the Royal Botanical Museum, at Berlin.

### *The Flora.*

Hillebrand's great work was his "*Flora of the Hawaiian Islands*," published two years after his death, 1888, by his son, W. F. Hillebrand. Since the date of its publication it has been the standard flora of the group, and the work of subsequent botanists has emphasized the integrity and thoroughness of Hillebrand's work. He described a large number of new species and varieties, and critically examined the work of his predecessors. In the introduction to the "*Flora*" he gives a philosophical dissertation upon the characteristics of the Hawaiian flora. Hillebrand's work represents the high-water mark of botanical study under the old-school and old terminology; the great taxonomic work of today is the adoption of the newer terminology, and the revision of the more difficult genera.

The only serious defect of Hillebrand's work is the absence of ecological data, but this omission he shared with all the botanists, taxonomists, and herbalists of his time. The large work of the future is to give the remarkable ecologic background of the Hawaiian flora the detailed investigation that it so fully merits.

### 28. JOHN M. LYDGATE AND OTHER LOCAL STUDENTS.

In addition to the visiting scientists who have frequented Hawaii's shores since the days of the first explorers, there has been a resident colony of amateur and professional horticulturalists, botanists, and investigators in the various departments of science. These men and women have not only rendered important aid to the visiting specialists, but in many instances have made important contributions to science on their own account.

#### *John M. Lydgate.*

For example, the Reverend John M. Lydgate, clergyman, civil engineer, and botanist, published in 1873 an enumeration of Hawaiian ferns, when a student in Oberlin College. His collections

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\* See also the *Botanische Zeitung* for Aug. 6, 1886; and *Allgemeine Deutsche Biographie*, Vol. 50, (nachträge bis 1899), 1905, p. 339.

from the Island of Kauai, an island particularly rich in endemic species and varieties, have added greatly to the herbaria of Hillebrand, the Bishop Museum, and other institutions, and have been worked upon by various specialists. Lydgate has been responsible for the finding of a considerable number of new species and varieties, and his name is perpetuated in a number of plant names.

### *Edward Bailey.*

In 1883 Edward Bailey published a small manual "Hawaiian Ferns, a Synopsis."

Mr. Valdemar Knudsen, of Kauai, Mr. D. D. Baldwin, of Maui, and the Rev. Edward Bishop, were all enthusiastic amateurs whose collections have been of no small value in taxonomic studies of the Hawaiian flora.

## 29. EXPLORATIONS BY HELLER.

In 1896 A. A. Heller, of the University of Minnesota, and his wife, visited the islands. He made numerous expeditions into the leeward forests of Oahu and Kauai. He did not visit the other islands. Heller published a very comprehensive list of his findings, with many new species and varieties, as Bulletin No. 9 (1897) of the Minnesota Botanical Studies, (pp. 760-922, with plates and maps). His work on Kauai took him into a rich and diversified region, and he made many additions and corrections to the work of Hillebrand. He also made some collections of the marine flora. Heller's collections were deposited in the herbarium of the University of Minnesota.

## 30. SCHAUINSLAND ON LAYSAN.

In 1896-97, H. Schauinsland, of Germany, spent three months on the Island of Laysan, and made extensive collections of the fauna and flora. He collected marine algae here, also plankton between Honolulu and Laysan, in the vicinity of Honolulu, and at Pearl Harbor. His book, "*Drei Monate auf einer Korallen Inseln*" (Bremen, 1899), described in detail the results of his visit to the archipelago. His collections of algae were worked up by Lemmermann.

## 31. VISIT OF MISS JOSEPHINE TILDEN.

In 1900 Miss Tilden, of the University of Minnesota, with her mother and Miss Crosby, made a visit to the islands for the purpose of collecting algae. They collected on Oahu and on the other larger islands, (Kauai, Maui and Hawaii). An account of her visit and work is given in "Postelsia," the yearbook of the Minnesota Seaside Station, for 1901. She published a list of one

hundred species collected, in Thrum's Hawaiian Annual for 1901. In her great work on the "*Myrophyceae of North America*," etc., she incorporates all of her own and other Hawaiian records.

### THE TWENTIETH CENTURY.

With annexation in 1898 as an integral part of the United States, and with the acquirement in this way of full Territorial status, the Hawaiian Islands entered upon a new era of industrial and scientific development. Since that time various scientific and botanical explorations have been carried on under the auspices of the Bernice Pauahi Bishop Museum, the Territorial Board of Agriculture and Forestry, the College of Hawaii, the Hawaii Agricultural Experiment Station, the Experiment Station of the Hawaiian Sugar Planters' Association, and other institutions. Much of this work has been of substantial value, both to science and to the various industries of the islands.

The present paper, however, can very appropriately close at this point. The pioneer period in the history of science in Hawaii can be said to have definitely closed with the end of the nineteenth century.

The main botanical work of the nineteenth century has been that of taxonomy—collecting, classifying, naming, herbalizing. The chief work of the twentieth century will be ecology—the intensive study of the living plant in its own normal environment. Just as the Hawaiian Islands have afforded much unique material to the taxonomist, so will they yield, in their rich and diversified ecologic background—much significant data upon the fundamental problems of plant ecology. Taxonomy in Hawaii has already reached its zenith; ecology is yet in its infancy.

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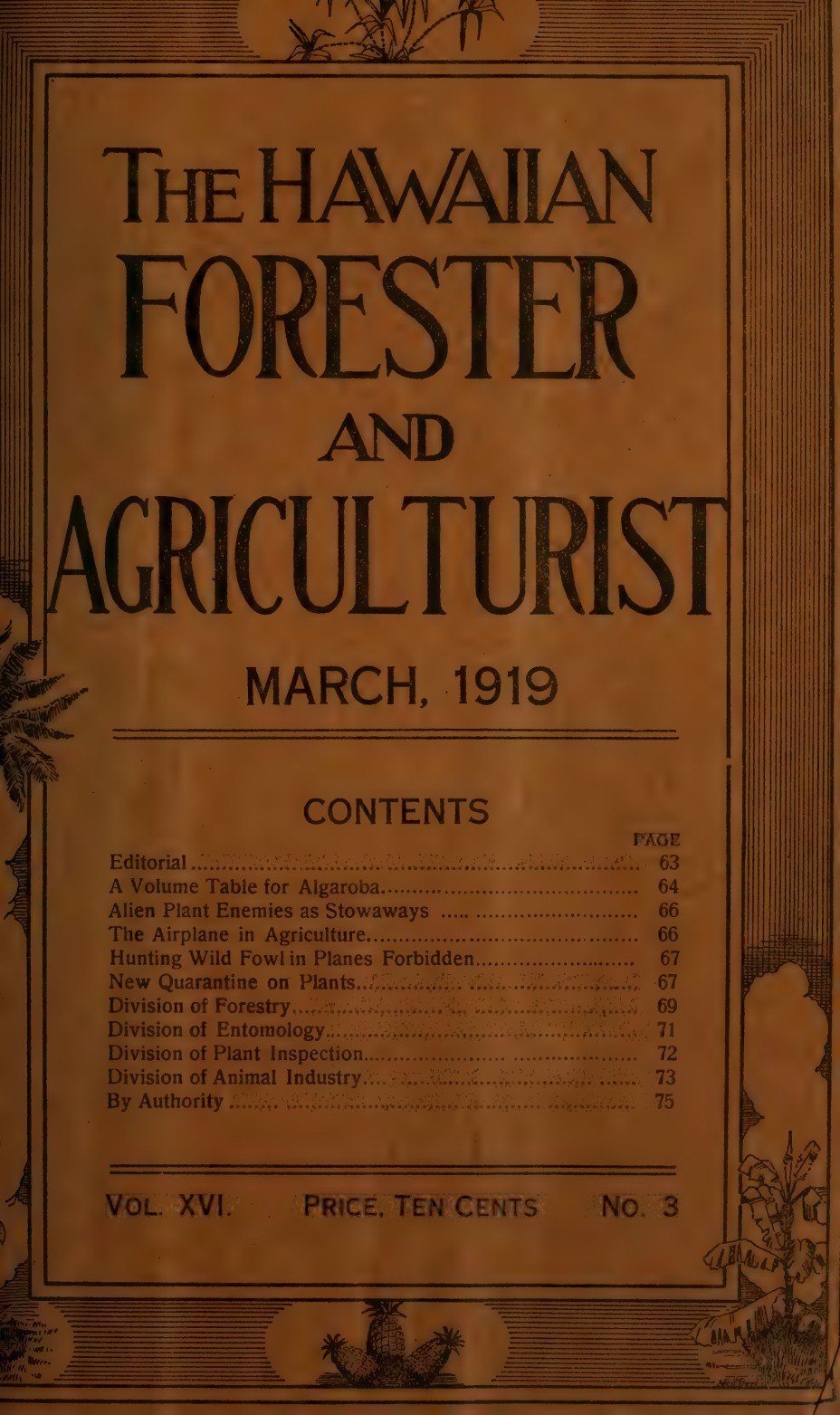
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

MARCH, 1919

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, MARCH, 1919.

No. 3

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Special attention is called to the volume table for algaroba appearing in this number which will be found of service to those desiring to know the amount of cordwood in standing trees on their land.

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The discovery made by the Superintendent of Forestry on January 23, 1919, of several trees of the native mamani, *Sophora chrysophylla*, in Keaau Valley, Waianae, Oahu, at an elevation of about 950 feet, makes a new record for this tree because, so far as is known, the mamani has never before been found on Oahu.

---

The biennial report of the Board for the period ended December 31, 1918, came off the press on March 17, and copies are now available for distribution. The report consists of 118 pages and treats in detail of the work of the four divisions during the past two years. Special features of the work are brought out by illustrations and of special interest are the maps of the five main islands showing in green the location and size of the 47 forest reserves.

---

The new regulation of the Federal Horticultural Board against the introduction of plants and seeds from foreign countries, which is termed "Notice of Quarantine No. 37," goes into effect on June 1, 1919, and applies to Hawaii as well as to the mainland. A concise description of this new regulation is presented in this issue but it would be well for importers of plants and seeds from abroad to acquaint themselves further with it.

---

The By Authority notice appearing in this issue calls for a public hearing at the Government Nursery on April 2, to consider the withdrawal of 415 acres of land from the Puu Ka Pele forest reserve on Kauai so that it can be turned over to the County of Kauai for the public purpose of recreation and camping. The land is situated at the crest of the scenic Waimea Canyon at an elevation of over 3000 feet, does not involve any water supply, and is eminently suited to this purpose.



# A Volume Table for Algaroba

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By C. S. JUDD, Superintendent of Forestry.

The severe wind storm of last December afforded an opportunity of obtaining certain measurements of windthrown algaroba trees, *Prosopis juliflora*, D. C., for the construction of a volume table for cordwood which may be useful to wood dealers and owners of tracts of algaroba land who desire to know the amount of wood in the trees standing on their land.

The use of a volume table in Hawaii is probably very little known to most residents because this is not a timber country, but on account of the increasing importance of the algaroba tree which, since its introduction in 1828, has spread over almost 80,000 acres of what was formerly waste or poor grazing land, increasing the value of such land many fold, this volume table, the first constructed for algaroba in these islands, may be of value to those who have occasion to use it.

It should be considered, however, in the nature of a preliminary table of local application which would not be suitable for all conditions of algaroba tree growth and hence it should be used only in the nature of a guide. The method of its construction and the character of timber involved are described at the head of the table. When used in closely-grown and tall timber where the yield of wood would naturally be greater, the values for the different diameters would have to be increased according to experience based on the yield secured from actual cuttings.

A volume table shows the average contents of standing trees of different sizes and is used to estimate the yield of wood standing on specified tracts. It is intended only for estimating a large number of trees because it is compiled from the average of a number of measurements and is necessarily inaccurate as applied to a single tree. The volumes of individual trees of the same species and same diameter may vary as much as 20 per cent.

The use of a volume table is very simple. The total contents of trees of any given diameter are computed by multiplying the number of trees of a certain diameter by the average volume given in the table for that diameter. For convenience, the diameters of the trees are measured at breast height, or at four and a half feet above the ground, and the volume table is based on this measurement. For example: If it is desired to determine the number of cords of wood in ten standing algaroba trees, four of which have a diameter of 12 inches and six of which have a diameter of 20 inches, by reference to the volume table it will be seen that the average volume of a 12-inch tree is .50 cord, or half a cord, which gives two cords for the four trees. Similarly, the average volume of a 20-inch tree is 1.50, or a cord and a half, which when multiplied by the number of trees of that diameter gives nine cords for the six trees. These results, when added together, give a total volume of 11 cords for the 10 trees.

The new volume table is as follows:

VOLUME TABLE FOR ALGAROA (*Prosopis Juliflora*).

Based on the measurement of 19 trees in the Punahou District, Honolulu, Hawaii, which were windthrown by the storm of December 3, 1918, and the wood subsequently cut and stacked in cords at the stump of each tree. Wood utilized down to two inches. Trees were of average height and growing in an open stand with full crowns. The diameter measurement is at breast height, or four and a half feet from the ground. Measurements include bark. Figures evened off by curve.

D. B. H. Ins.	Vol. Cords.
6	.10
7	.12
8	.20
9	.25
10	.30
11	.40
12	.50
13	.60
14	.80
15	.90
16	1.00
17	1.15
18	1.30
19	1.40
20	1.50
21	1.70
22	1.80
23	2.00
24	2.10
25	2.25
26	2.40
27	2.50
28	2.70
29	2.90
30	3.00
31	3.20
32	3.50
33	3.80
34	4.20
35	5.00
36	6.50

Very few data have so far been collected on the actual yield in cordwood from algaroba tracts which have been cut over, but a few figures which have come to the Division of Forestry may be of interest to those who own algaroba forests. In central Maui, an area of six acres when cut clean for cordwood yielded 349

cords, or at the rate of 58 cords per acre. At Waianae, Oahu, algaroba cuttings in which the wood was utilized down to two inches yielded on an average of 36 cords per acre, while at Makaha, on the same island, a tract of 152 acres, parts of which were without trees, yielded 1462 cords, or an average of 9.50 cords per acre. The yield in cordwood will naturally vary according to the size of the trees and the manner in which the land is stocked.

As for the age and size of the older algaroba trees, inquiry of an old resident of Honolulu has elicited the information that the grove of algaroba trees at the entrance to the Punahou grounds, which suffered severely in the recent storm, originated after 1848, because before that date the school boys raised summer squashes and string beans on the very same land. These trees now, after a period of about 70 years, range from 24 to 41 inches in diameter and from 65 to 85 feet in height.

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Forest fencing, tree planting, several forms of forest protection, and protection of bird life constituted the main field activities of the Division of Forestry during January, as will be seen by the report of the Superintendent of Forestry in this issue.

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The apple is the king of fruits in value of crop as well as in the estimation of apple lovers. For the apple crop of 1918 a value of \$230,000,000 has been estimated, or nearly three-eighths of the value of all fruits.

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### ALIEN PLANT ENEMIES AS STOWAWAYS.

For a long time a great many ships coming from Europe into the port of New York have been dumping earth ballast along the shores of East River, Hudson River, and elsewhere around the bay. This is a source of risk of the entry of undesirable plants and plant pests, in the opinion of the United States Department of Agriculture, and an inquiry has been started to determine the extent of this risk and to provide safeguards against it. There is a possibility of the introduction of soil-infecting diseases, injurious nematodes, and hibernating insects, any of which, unless preventive measures were taken, might spread over the country or considerable parts of it.

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### THE AIRPLANE IN AGRICULTURE.

In connection with scouting and other survey work in Texas, the United States Department of Agriculture is putting the airplane to its first practical application in agriculture. A try-out of this method of survey was made last year along the Trinity River and resulted in the discovery of several outlaw cotton fields in heavy timber, which had previously escaped detection. This year the airplane is to be used more extensively. It has been found a valuable aid in pink boll-worm work, as it makes possible the easy mapping, by means of photographs, of the quarantined territory, and facilitates the inspection work in forested

areas, especially in such long stretches of country as the valley of the Rio Grande and its tributaries.

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## HUNTING WILD FOWL IN PLANES FORBIDDEN.

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The director of military aeronautics has forbidden the shooting of wild fowl with machine guns from airplanes and has directed that airplane flights along the Atlantic coast or at any place where migratory wild fowl may be found shall be conducted in such a manner as to interfere as little as possible with the habits and feeding of the wild fowl. Commanding officers are instructed to use every means to carry out the regulations and to bring to trial any offenders that may be guilty of breaking any of them. Complaints of the shooting of wild fowl with machine guns from airplanes were received some time ago by the Department of Agriculture from several places along the Atlantic coast. The attention of the War Department was called to the fact that such shooting was in violation of the Federal migratory bird law enacted last year to give effect to the treaty between the United States and Great Britain.—*Weekly News Letter*.

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## New Quarantine on Plants

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The effective date—June 1, 1919—of Plant Quarantine No. 37 will mark the operation of new and strict regulations governing the importation into the United States of plants and plant products. The quarantine order has been promulgated by the Secretary of Agriculture to check so far as possible the introduction of more dangerous crop enemies. Experts of the Department of Agriculture estimate that the losses caused by the pests already introduced, for the most part through the agency of imported plants, aggregate half a billion dollars annually.

### OUTSTANDING FEATURES SUMMARIZED.

Important provisions of the new quarantine are as follows:

*Requires permits* and compliance with regulations for importation of lily bulbs, lily-of-the-valley, narcissus, hyacinths, tulips, and crocus; stocks, cuttings, scions, and buds, of fruits for propagation; rose stocks for propagation, including Manetti, Multiflora, Brier Rose, and Rosa Rugosa; nuts, including palm seeds, for propagation; seeds of fruit, forest, ornamental, and shade trees, seeds of deciduous and evergreen ornamental shrubs, and seeds of hardy perennial plants.

*Leaves unrestricted*, except in special cases, importations of fruits, vegetables, cereals, and other plant products imported for medicinal, food, or manufacturing purposes; and field, vegetable, and flower seeds.

*Excludes* all other classes of plants for propagation, including fruit trees, grapevines, bush fruits, grafted and budded roses, forest, ornamental, and deciduous trees, ornamental and deciduous shrubs, pine trees of all kinds, broad-leaved evergreens (such



as azaleas and rhododendrons), and a long list of plant material commonly known as florists' stock.

*Excluded plants may still be imported* through the agency of the Department of Agriculture, in limited quantities to supply the country with novelties and necessary propagating stock, such entry being safeguarded by the highly-developed inspection and quarantine service which has been organized by the department.

The governing principle in this quarantine is to limit plant introductions to the classes of plants which have been represented by the plant interests concerned in this country as being essential to plant production—in other words, the raw material out of which salable fruit trees, roses, etc., are made. To these were added certain classes of plants, including bulbs and seeds, which could be safeguarded by inspection and disinfection.

The plants permitted entry represent a considerable proportion of foreign plants and seeds hitherto imported, but exclude the classes of plants, including all plants with earth, which are open to special danger of importing new pests. The excluded plants are largely ornamentals imported to be turned over at a quick profit, and, on the authority of the experts of the department and of leading plant growers, can be produced for the most part in sufficient quantities in this country.

#### DANGEROUS BULBS EXCLUDED.

In the case of bulbs it was realized that a danger existed and the entry was restricted to classes of bulbs least subject to risk of bringing in new pests and which from their nature could be most readily inspected and determined as clean. The excluded bulbs involve the less important and miscellaneous importations coming from widely scattered sources and the entry of which is attended with greater risk of introduction of plant diseases and insect pests.

Disinfection by any known means is not possible in the case of most of the ornamental plants excluded, and particularly those which come with soil about the roots. No disinfection of soil is possible without destroying the plants, and, furthermore, many insects and practically all diseases are not capable of control by disinfection and are not disclosed by inspection. This condition, requiring removal of soil and holding in quarantine for considerable periods, as is done in case of departmental importations, precludes safeguarding of importations on a commercial scale.

#### DANGER IN UNKNOWN PESTS.

The number of known foreign pests awaiting entry to the United States is vastly larger than those which have already gained entrance, and the unknown foreign pest is an uncertain quantity, perhaps more dangerous than the known pests, officials point out.

The risk is illustrated by recent introductions—for example, the alfalfa weevil, the oriental peach moth, the Japanese beetle, and the citrus canker, together with such older importations as the San Jose scale, the brown-tail moth, the chestnut-blight disease and the white-pine blister rust.

Foreign pests introduced with imported plants are now costing the United States each year more than the total value of such importations since the founding of the Republic.—*Weekly News Letter*.

## Division of Forestry

Honolulu, Hawaii, February 24, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of January, 1919:

### FOREST FENCING.

As a result of correspondence with the Commissioner of Public Lands, which was initiated over a year ago, the holder of General Lease No. 550 has at last constructed the required fence, somewhat over a mile in length, on the boundary of the Kau Forest Reserve, across the land of Kiolakaa, Hawaii.

Final arrangements were made during the month for the construction in February of the fence on the makai boundary of the Makua-Keaau Forest Reserve across the Keaau Valley, Oahu. The total length is 4168 feet. A part of this is adjacent to Lot 1 of the Keaau homesteads, the holder of which has agreed to pay half the cost of the fence.

One hundred coils of No. 6 special heavy galvanized fence wire ordered on July 5, 1918, arrived from the factory on January 16 and a part of this has already been put to good use. Another hundred coils has been ordered so as to have it come in time for further fencing.

### FOREST RESERVE MAPS.

The large island maps have been brought up to date at the Survey Office by having the new forest reserves and recent additions placed thereon and smaller maps have been made for the biennial report of the five main islands showing in green all forest reserve areas.

### PROTECTION OF BIRD LIFE.

On January 3 a visit was made to the two small government islands of Mokulua off Waimanalo, Oahu, in company with Mr. J. F. G. Stokes of the Bishop Museum, and wooden signs warning against violations of Rule IV of this Division were placed on each.

### DISPOSAL OF WOOD.

Sheriff Jarrett has promised to assist in removing the wood of fallen eucalyptus trees in the lower part of the planted forest on Tantalus, and a start has also been made in its disposal by placing a charcoal burner on the job.

In Sec. C of the Olaa Forest Park reserve along the Volcano road, Hawaii, a beginning has been made in disposing of the dead ohia trees which overhang the road and are a menace. Thirty cords have been sold and cut for \$1.00 per cord, the money going into the special fund for the preservation and extension of forest reserves.

### TREE PLANTING.

During the month the following trees were planted on forest reserves:

On Oahu, Honolulu Watershed forest reserve in Opu Valley, Makiki, 230 koa; Lualualei forest reserve in Mikilua, 1668 koa, 582 monkey pod, 170 wiliwili, 645 yellow poinciana and 220 kassod. On Kauai in the Kealia forest reserve 200 swamp mahogany trees were planted along the boundary fence. Total for the month, 3715 trees.

## MISCELLANEOUS.

On an inspection trip to Kuliouou, Oahu, on January 18, 11 wild goats were shot in the forest reserve.

On January 23, while measuring for the fence at Keaau, Oahu, several mamani trees were discovered at an elevation of about 950 feet near the Ohikilolo boundary. They were in flower and fruit and the identification was confirmed by Consulting Botanist J. F. Roek. So far as is known this is the first time that the mamani has been found on Oahu.

## BIENNIAL REPORT.

A large portion of the month was spent in writing the report of the Division of Forestry for the biennial period ended December 31, 1918.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, January 31, 1919.

Superintendent of Forestry, Honolulu.

DEAR SIR:—I herewith submit a report of the work done during the month of January, 1919:

## NURSERY.

*Distribution of Plants.*

	In Seed Boxes.	In Transplant Boxes.	Pot Grown.	TOTAL.
Sold . . . . .	....	....	390	390
Gratis . . . . .	6000	2000	1401	9401
	<hr/> 6000	<hr/> 2000	<hr/> 1791	<hr/> 9791

## COLLECTIONS.

Collections on account of plants sold.....	\$ 8.80
Rent of office Nursery ground for November.....	35.00
	<hr/> \$ 43.80

## PLANTATION COMPANIES AND OTHER CORPORATIONS.

We have received during the month orders for 5000 transplants to be delivered when ready. We also have on file orders for 3500 transplants applied for some time ago.

## MAKIKI STATION.

We are now busy increasing our stock, which was reduced considerably during the planting season. We have been fortunate in being able to procure cuts from a large number of trees blown down by the last wind storm. Many of the species came from Mrs. Mary E. Foster's place on Nuuanu avenue. We are certainly indebted to Mrs. Foster for her kindness in allowing us during the past twenty years to collect seed and plants in her garden. Part of the seed collected was used for exchange purposes and the balance propagated and the plants distributed to people all over the islands. For Mrs. Foster's generous help we take this opportunity of asking her to accept our sincere thanks.

## HONOLULU WATERSHED.

The work on the Opu Valley section of watershed consisted of the planting of 230 koa trees, making holes and hoeing.

## ADVICE AND ASSISTANCE.

The writer has at the request of people in and around the city made the following number of calls, etc.:

Calls made .....	7
Advice given people calling at Nursery.....	8
Advice given people by telephone .....	3

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## Division of Entomology

Honolulu, Hawaii, February 20, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month of January the insectary handled 15,000 pupae of the melon fly, from which there were bred 2379 females and 2532 males, *Opius fletcheri*.

The distribution of parasites was as follows:

## MELON FLY PARASITE.

*Opius fletcheri*.

	Females.	Males.
OAHU:		
Moiliili . . . . .	860	850
Manoa . . . . .	310	260
Lualualei . . . . .	1120	1375
HAWAII:		
Hilo . . . . .	110	85

## CORN LEAF HOPPER PARASITE.

*Paranagrus osborni*.

OAHU:	
Makiki Nursery . . . . .	6,400
Manoa . . . . .	3,000
Kailua . . . . .	5,800
HAWAII:	
Kohala . . . . .	4,300
KAUAI:	
Lihue . . . . .	11,000

Respectfully yours,

DAVID T. FULLAWAY,  
Entomologist.



# Division of Plant Inspection

Honolulu, Hawaii, January 31, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of January, 1919, as follows:

During the month there arrived at the Port of Honolulu 56 vessels, of which 16 carried vegetable matter subject to inspection. Two of the vessels came via Panama and one carried sand. The following disposal was made of the various shipments:

	<i>Lots.</i>	<i>Parcels.</i>
Passed as free from pests.....	292	14,501
Burned .....	15	15
Fumigated . . . . .	...	....
Returned . . . . .	...	....
Total inspected .....	307	14,516

Of these shipments 14,419 packages arrived as freight, 66 packages as baggage and 31 packages as mail.

## RICE AND BEAN SHIPMENTS.

During the month 11,721 bags of rice and 1111 bags of beans from Japan were inspected and found free from pests.

## PESTS INTERCEPTED.

Approximately 2029 pieces of baggage belonging to passengers and immigrants from foreign ports were examined, from which were taken and burned 12 lots of fruit and three lots of vegetables.

On January 7, a parcel of tree seed in the baggage from Manila was burned, being mouldy and otherwise objectionable.

During the month the following cereals, etc., were fumigated for the accommodation of local merchants:

Rice . . . . .	20 bags
Corn . . . . .	392 "
Middlings . . . . .	50 "
Flour . . . . .	50 "
Other cereals . . . . .	150 "

662 bags

## HILO INSPECTION.

Brother Matthias Newell reports the arrival at the port of Hilo of eight vessels which carried vegetable matter consisting of 69 lots and 3365 packages, all of which were free from pests.

## KAHULUI INSPECTION.

Mr. Will J. Cooper reports the arrival of seven steamers at the port of Kahului, none of which carried vegetable matter.

## INTER-ISLAND INSPECTION.

Fifty-nine steamers plying between Honolulu and other Island ports were attended and the following shipments were passed as free from pests:

Taro . . . . .	
Vegetables . . . . .	219 packages
Fruits . . . . .	90   “
Plants . . . . .	59   “

Total passed . . . . . 1076 packages

Eighteen packages of plants and five packages of fruit were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

## Division of Animal Industry

Honolulu, Hawaii, February 18, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of January, 1919.

### *Federal Indemnification for Tuberculous Cattle.*

The efforts of this office at having the Territory share in the federal appropriation for indemnification of owners of tuberculous cattle slaughtered with a view to eradicating bovine tuberculosis received encouragement through the receipt of the following cablegram from Delegate Kalani-anaole:

“Washington, D. C., Feb. 1, 1919.

“Board of Agriculture and Forestry, Honolulu.

“House adopts amendment including Territory in fund for indemnification slaughter tuberculous animals.

KALANIANAOLE.”

The cablegram has now been confirmed by the following letter from the Chief of the Federal Bureau of Animal Industry:

“January 31, 1919.

“Dr. Victor A. Norgaard, Territorial Veterinarian,  
Honolulu, Hawaii.

DEAR DR. NORGAARD:—Again referring to your letter of January 13 with reference to the omission of the term ‘territory’ in last year’s appropriation bill in the item for tuberculosis eradication, I wish to advise you that an amendment was adopted yesterday in the House inserting the word ‘territory’ in four places in the Agricultural Appropriation Act for next year. I feel certain that the Senate will concur in this amendment, and if so we will be able to cooperate in indemnifying owners of cattle destroyed in Hawaii after July 1, providing, of course, your Territory will make provisions for similar indemnities.

“Very truly yours,

“J. R. MOHLER,  
“Chief of Bureau.”

It would, therefore, seem highly probable that the Territory will be invited to co-operate with the federal authorities, and as this will require compliance with federal rules and regulations it has been found necessary again to alter the amended Territorial indemnification law (Act 121, Session Laws, 1917) which was submitted for the Board's approval last month.

In Section 4 of this Act it was recommended that reacting cattle should be surrendered to this Board for slaughter and sale, the proceeds of such sale to be paid to the owner. The federal regulations, however, specify that "Each owner of tuberculous cattle which have been appraised shall market the cattle . . . ." and it has therefore appeared advisable to return to the original act which conformed with this requirement. The remaining amendments being quite extensive the Attorney General decided that it would be better to repeal the original law and submit a new act to the coming Legislature. This afforded an opportunity to revise the entire law and a copy of the new act which meets with the approval of the Attorney General is herewith submitted for the approval of the Board.

With the exception of the above mentioned amendment the revision consists in simplification of language and elimination of repetitions.

Very respectfully,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

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#### REPORT OF ASSISTANT VETERINARIAN.

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Honolulu, Hawaii, January 31, 1919.

Dr. V. A. Norgaard, Chief, Division of Animal Industry, Bureau of Agriculture and Forestry, Honolulu, T.H.

DEAR SIR:—I beg to submit the following report for the month of January, 1919:

##### *Tuberculosis Control.*

The following dairy cattle were tuberculin tested during the past month:  
Tested. Passed. Cond'md.

D. Yamashito . . . . .	13	13	0
C. W. Lucas . . . . .	16	16	0
J. P. Mendonca . . . . .	2	2	0
W. Lanz . . . . .	4	4	0

A total of 35 head of cattle were tested, all of which passed.

##### *Importations of Live Stock.*

S. S. Shinyo Maru, Orient: 2 dogs, 1 orangoutang, E. C. Waterhouse.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

## By Authority

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NOTICE IS HEREBY GIVEN that, as provided by law, a public hearing will be held by the Governor of the Territory and the Board of Commissioners of Agriculture and Forestry on Wednesday, the 2nd day of April, 1919, at 10 o'clock a. m., in the office of the Board of Commissioners of Agriculture and Forestry, King Street, Honolulu, to consider the withdrawal from the Puu Ka Pele Forest Reserve, Waimea, Kauai, of an area of 415 acres, more or less.

A map and description of the said land are on file in the office of the Superintendent of Forestry, where they are open to the inspection of the public.

At the said time and place all persons who so desire may be given full opportunity to be heard upon the subject matter of this notice and to present evidence and arguments in person, by proxy, or letter either for or against the withdrawal of this land from the aforesaid forest reserve.

C. J. MCCARTHY,  
Governor of Hawaii.

The Capitol, Honolulu, T. H., March 17, 1919.



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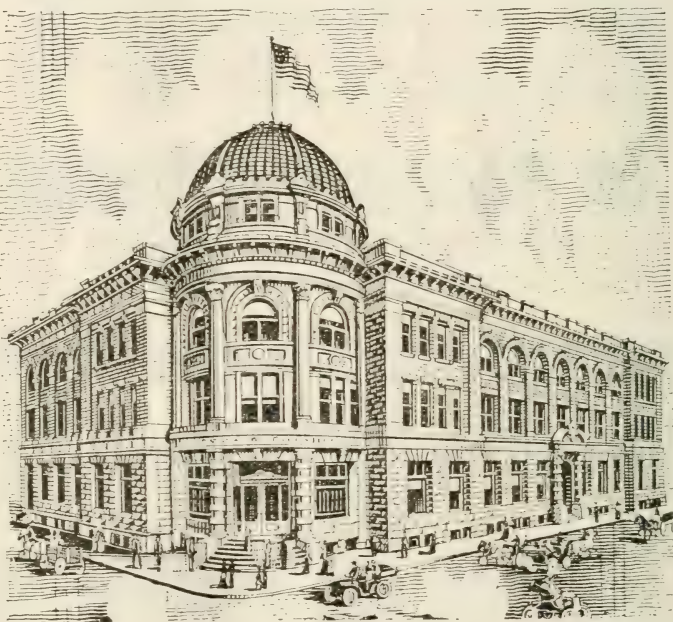
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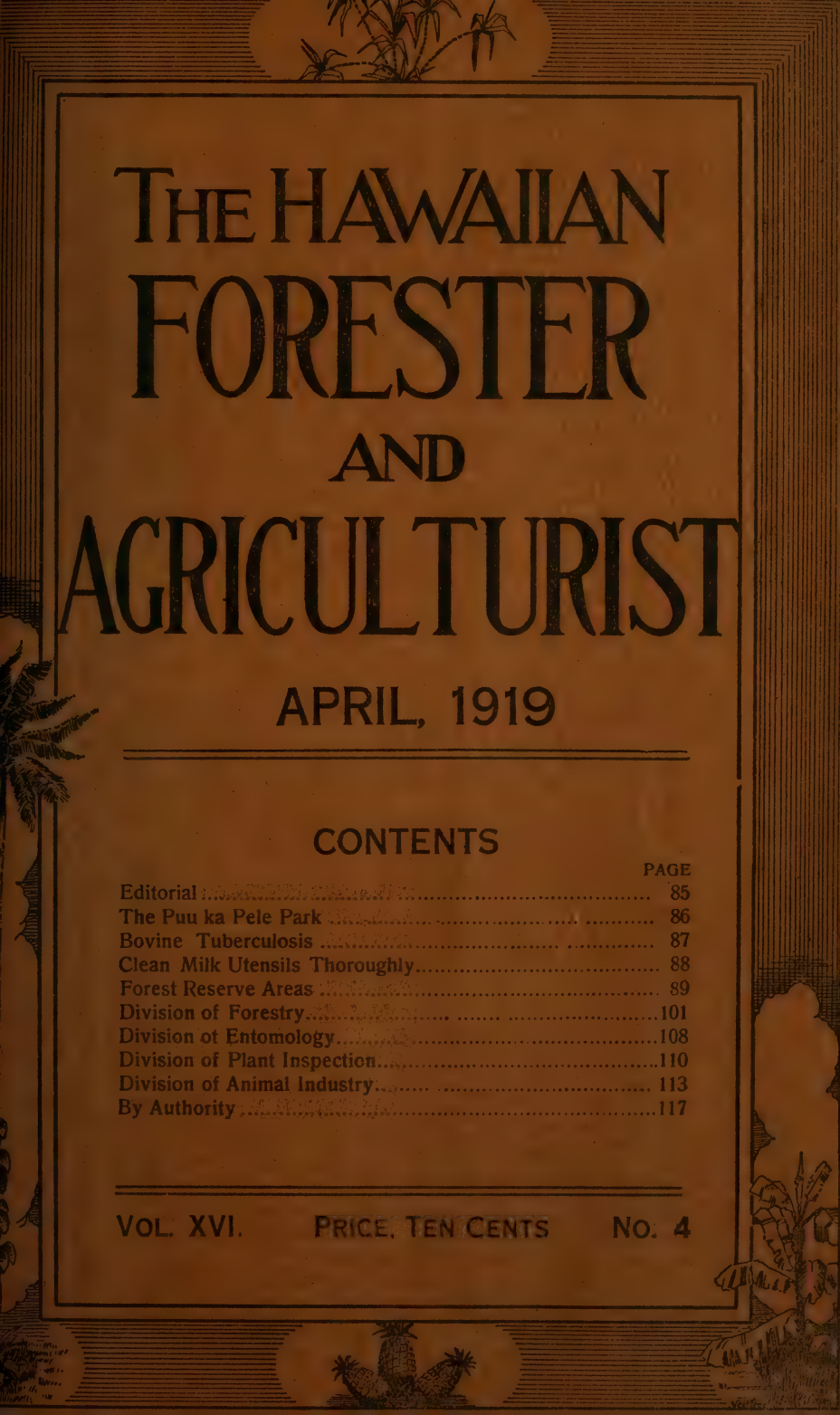
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

APRIL, 1919

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# Board of Agriculture and Forestry

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### FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

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The Board of Commissioners issues for general distribution to persons in the Territory, annual reports, bulletins, circulars, copies of its rules and regulations, and other occasional papers, which may be had, free, upon application.

A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

THE HAWAIIAN FORESTER  
AND AGRICULTURIST

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VOL. XVI.

HONOLULU, APRIL, 1919.

No. 4

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The distribution of beneficial insects by the Entomologist has been continued with reported good results to corn growers and other agriculturists.

---

The Parker Ranch has continued its policy of improving its sheep stock by the recent importation of fifty high class Merino rams from New Zealand.

---

From reports submitted to the Superintendent of Forestry, the following number of wild animals were eliminated from forest reserves during the first quarter of this year: 7 cattle, 49 goats and 62 pigs.

---

The new Puu Ka Pele Park on Kauai, described in a special article in this number, will be appreciated by all who are fond of camping in a refreshing climate and are attracted by outdoor recreation.

---

The current issue contains a complete list of all lands within proclaimed forest reserve boundaries which will doubtless be of value to those who are interested in forest protection for the conservation of water.

---

The death from anthrax of a saddle horse on the Princeville Plantation, Kauai, which occurred in March, justifies the quarantine which has continued to be maintained on the pastures where the infection still remains.

---

Progress is being made by the Division of Forestry in enlarging its present sub-nurseries and in establishing new nurseries on the other islands so that it soon will be unnecessary to send out trees in soil from Oahu to any other island.

---

During February and March the Division of Forestry planted out 2462 trees on forest reserves. Over half of these consisted of the native koa and the remainder were mahogany, swamp mahogany, yellow poinciana, and ironwood.

The completion of 2.91 miles of new fences and the repairing of 3 miles of existing fences on forest reserve boundaries during February and March constitute a good beginning toward forest protection for the year which it is hoped an adequate appropriation by the present legislature will make it possible to continue during the coming new biennial period.

The Board, on April 14, appointed Antone P. Aguiar, the present caretaker of the Hilo Animal Quarantine Station, as Forest Ranger for the Panaewa Forest Reserve, Hawaii. This reserve, four miles out from Hilo, is crossed by the new concrete road to the Volcano and will receive protection against trespass and fire and will be beautified by judicious tree planting by the new ranger who can spare the time from the quarantine station for this work.

## The Puu Ka Pele Park

At a meeting of this Board held on March 10, there was considered an application from the Kauai Chamber of Commerce, the Kauai Planters' Association, and the Kauai Board of Supervisors for the assistance of this Board in establishing a public park and summer camp on the edge of the Waimea Canyon for the people of Kauai and the other islands of the Territory, to be placed under the control of the County of Kauai. The above organizations stated that it was their plan: First, to secure title to the land required; second, to improve the road up the mountain, and third, to raise the necessary money and erect such buildings as may be needed at first. The area desired consisted of 415 acres, within the Puu Ka Pele Forest Reserve, Kauai, in the form of a narrow strip of land approximately 1,500 feet wide and 2.3 miles long, situated on the brink of the Waimea Canyon, at an elevation of 3,500 feet, near the peak called Puu Ka Pele.

In order to make such land available for this purpose, it was necessary first to eliminate it from the forest reserve. This the Board voted to do, after it was brought out by discussion that no source of water supply was involved, by unanimously passing the following resolution:

"Resolved, that in accordance with the application of the Kauai Board of Supervisors, as set forth in their letter to the Board, dated March 7, 1919, the Board of Commissioners of Agriculture and Forestry recommends to the Governor the withdrawal from the Puu Ka Pele Forest Reserve, Kauai, of a tract of land not to exceed 416 acres, located as shown on the sketch submitted, with the understanding that, if at any time this tract ceases to be used as a park and summer camp for public purposes, it should revert back to the Board of Agriculture and Forestry.

"And be it further resolved, that the rules and regulations of the Division of Forestry pertaining to forest reserves and any other special conditions which may seem necessary be embodied in the transfer of the land to the County of Kauai."

To consider this withdrawal of land from the Puu Ka Pele Forest Reserve, a special hearing was advertised for April 2. No one appearing at this hearing to present objections, the Governor on the same day signed the proclamation making the withdrawal. The proclamation is printed in this same issue.

Further steps toward turning the land over to the County of Kauai will be taken by the Governor and the Commissioner of Public Lands.

The County of Kauai has already begun to improve the road leading from Kekaha up to the area so as to make the park more accessible by automobiles for use during the coming summer.

---

## Bovine Tuberculosis

---

The accredited-herd plan of eradicating animal tuberculosis will be carried on until practically all pure-bred herds of cattle in the United States are under state and federal supervision, according to statements from the Bureau of Animal Industry at Washington, which advises the greatest care in bringing in animals from other sections of the country and to make sure that they are free from tuberculosis.

Dr. J. A. Kiernan, chief of the tuberculosis eradicating division, states that trafficking in tuberculous animals has proved a great bane to the cattle industry and that the person who disposes of tuberculous animals for purposes other than immediate slaughter works a great injustice upon his neighbor and the live stock industry. There are instances where certain dealers have waxed fat in dealing with diseased animals, but in most instances such dealers have come to grief. They have been the worst enemies the live stock industry ever had except the cattle rustler.

Wherever and whenever owners have placed their herds under supervision for the eradication of tuberculosis and have followed the prescribed rules they have succeeded in getting rid of the disease, Dr. Kiernan said. Tuberculosis eradication work is being carried on in more than 40 states in co-operation with the State live stock sanitary officials and the stock owners. Joint agreements between the State and the Bureau of Animal Industry governing the application of the tuberculin test and the handling of the cattle, are forwarded to each owner interested in having his herd freed from tuberculosis or in having it accepted as officially accredited.



## CLEAN MILK UTENSILS THOROUGHLY.

---

Need for thoroughly washing and sterilizing milk utensils is shown in a striking manner by investigations conducted by the U. S. Department of Agriculture on the principal sources of impurities in milk.

Among the results announced by the Federal dairy experts in Farmers' Bulletin 1019, "Straining Milk," are the following:

Strainer cloths containing 35,000,000 bacteria per square inch have been found in use on dairy farms.

The average strainer cloth, of which about 36 square inches is in contact with the milk, is likely to contain fully a billion bacteria if it is not washed and sterilized after each milking.

If the cloth is folded, the number of bacteria is likely to be still greater.

Milk produced under conditions where utensils were not sterile was found to contain more than 666,000 bacteria per cubic centimeter.

When all utensils were sterilized, the average bacterial count was only about 31,000 per cubic centimeter or less than one-twentieth as many.

Bacteria in milk are not necessarily injurious to health, but they reduce its keeping quality. Certain kinds of bacteria, if too numerous, also affect its palatability. For the production of clean milk the Department of Agriculture urges strict sanitation in every dairy operation.

Utensils and strainer cloths should be thoroughly washed with warm water and washing powder, then rinsed in clean water and sterilized by boiling or steaming for five minutes. After sterilization, the utensils, including pails, cans, strainers, and strainer cloths, should be hung in a clean place where they will be protected from flies and dust. Milk as it leaves the udder of healthy cows is clean and pure and may be kept so by following the methods outlined.

# Forest Reserve Areas

LANDS IN FOREST RESERVES, TERRITORY OF HAWAII,  
APRIL 1, 1919.  
ISLAND OF KAUAI.

Reserve	Name of Land	District	Government Land		Private Land, Acres
			Unleased Acres	Leased Acres	
Na Pali-Kona....	Haena.....	Halelea.....	.....	.....	500
	Hanakapiai.....	Na Pali.....	130	.....	.....
	Na Pali.....	".....	10,340	.....	.....
	Miloli.....	Kona.....	.....	*5,808	.....
	Waimea.....	".....	24,372	.....	.....
	Makaweli.....	".....	.....	.....	10,030
	Hanapepe.....	".....	.....	.....	9,360
			34,842	5,808	19,890
Puu Ka Pele.....	Waimea.....	Kona.....	1,800	.....	.....
	Waimea.....	".....	.....	*2,685	.....
			1,800	2,685	.....
Papapaholahola...	Kalaheo.....	Kona.....	54	.....	.....
Lihue-Koloa.....	Hanapepe.....	Kona.....	.....	.....	10
	Wahiawa.....	".....	.....	.....	2,075
	Kalaheo.....	".....	1,275	.....	.....
	Lawai.....	".....	.....	.....	350
	Koloa.....	".....	.....	.....	980
	Haiku.....	Puna.....	.....	.....	2,900
	Hanamaulu.....	".....	.....	.....	9,580
	Wailua.....	".....	11,670	.....	.....
	North Olohena.....	".....	150	.....	.....
	Waipouli.....	".....	270	.....	.....
			13,365	.....	15,895
Nonou.....	Wailua Uka.....	Puna.....	214	.....	.....
	Wailua Kai.....	".....	.....	† 361	.....
	Waipouli and				
	North Olohena.....	".....	.....	† 42	.....
	South Olohena.....	".....	.....	† 201	.....
			214	604	.....
Kealia.....	Kapaa.....	Puna.....	2,334	.....	.....
	Kealia.....	".....	.....	.....	2,550
	Kamalomaloo.....	".....	1,033	.....	.....
	Anahola.....	Koolau.....	4,018	.....	.....
			7,385	.....	2,550

\* Lease expires June 1, 1920.

† " " July 1, 1921.

‡ " " Jan. 14, 1921.

## ISLAND OF KAUAI—Continued.

Reserve	Name of Land	District	Government Land		Private Land, Acres
			Unleased, Acres	Leased, Acres	
Moloaa.....	Aliomanu.....	Koolau.....	.....	.....	125
	Moloaa.....	“ .....	.....	.....	8
	Papaa Moloaa.....	“ .....	2,160	.....	.....
	Pilaa.....	“ .....	.....	.....	40
	Papaa.....	“ .....	.....	.....	5
	Papaa.....	“ .....	1,418	.....	.....
	Kahili.....	“ .....	.....	.....	475
	Kilauea.....	“ .....	.....	.....	1,390
			3,578		2,043
Halelea.....	Kalihiwai.....	Halelea.....	.....	.....	5,685
	Hanalei.....	“ .....	8,340	.....	.....
	Waioli.....	“ .....	2,650	.....	.....
	Waipa.....	“ .....	.....	.....	800
	Lumahai.....	“ .....	.....	.....	8,975
	Wainiha.....	“ .....	.....	.....	11,050
			10,990		26,510
	Totals for Kauai.....		72,228	9,097	66,888

## ISLAND OF OAHU.

Reserve	Name of Land	District	Government Unleased, Acres	Private Leased, Acres
Kuaokala.....	Kuaokala.....	Waialua.....	434	.....
Makua-Keaau....	Kahanahaiki.....	Waianae.....	970	.....
	Makua.....	“.....	1,660	.....
	Ohikilolo.....	“.....	.....	340
	Keaau.....	“.....	1,850	.....
			4,480	340
Waianae-Kai.....	Waianae-Kai.....	Waianae.....	3,546	.....
	Waianae Grants.....	“.....	.....	107
			3,546	107
Lualualei.....	Lualualei.....	Waianae.....	3,743	.....
Nanakuli.....	Nanakuli.....	Waianae.....	1,010	.....
Kuliouou.....	Kuliouou.....	Kona.....	214	.....
Manoa Ranger Station.....	Kahoiwai.....	Honolulu.....	15	.....
Round Top.....	Makiki.....	Honolulu.....	115	.....
Honolulu Watershed.....	Palolo.....	Honolulu.....	910	.....
	Manoa.....	“.....	780	.....
	Makiki.....	“.....	563	.....
	Kalawahine.....	“.....	255	.....
	Nuuanu.....	“.....	2,160	.....
	Kalihi.....	“.....	330	.....
	Scattered in above...	“.....	.....	1,952
			4,998	1,952
Ewa.....	Halawa.....	Ewa.....	.....	3,846
	Aiea.....	“.....	383	.....
	Kalauao.....	“.....	.....	1,538
	Waimalu.....	“.....	.....	2,238
	Waiau.....	“.....	.....	1,320
	Waimano.....	“.....	790	.....
	Manana.....	“.....	.....	1,090
	Waiawa.....	“.....	.....	4,040
	Waipio.....	“.....	.....	5,080
	Waianae-Uka.....	Waianae.....	.....	4,247
	Wahiawa.....	Waialua.....	3,978	.....
			5,151	23,399



## ISLAND OF OAHU—Continued.

Reserve	Name of Land	District	Government Unleased, Acres	Private Leased, Acres
Waiahole.....	Makawai.....	Koolaupoko...	889	.....
	Kapikokau.....	" .....	54	.....
	Waianu I.....	" .....	186	.....
	Makawai Apanas....	" .....	.....	5
	Waianu I Apana....	" .....	.....	1
	Waianu I Portion....	" .....	.....	2
	Hanakea.....	" .....	.....	32
			1,129	40
Hauula.....	Kahana.....	Koolauloa.....	.....	3,920
	Punaluu L. C. A.'s...	" .....	.....	28
	Punaluu.....	" .....	.....	2,950
	Makaua.....	" .....	.....	48
	Waiono.....	" .....	.....	47
	Kaluanui.....	" .....	.....	1,033
	Makao.....	" .....	.....	24
	Hauula.....	" .....	1,143	.....
			1,143	8,050
Kaipapau.....	Kaipapau.....	Koolauloa.....	913	.....
Pupukea.....	Pupukea-Paumalu...	Koolauloa.....	864	.....
Mokuleia.....	Mokuleia.....	Waialua.....	5,850	.....
	Kawaihapai.....	" .....	320	.....
	Kealia.....	" .....	120	.....
			6,290	.....
	Totals for Oahu.....		34,045	33,888

## ISLAND OF MOLOKAI.

Reserve	Name of Land	Government Land		Private Land, Acres
		Unleased, Acres	Leased, Acres	
Molokai.....	Ioli.....	.....	.....	156
	Naiwa.....	.....	.....	70
	Kahanui.....	.....	.....	317
	Kalamaula.....	1,621	.....	.....
	Kahanui G. 3437.....	.....	.....	1,048
	Kaunakakai.....	.....	.....	965
	Kapaakea.....	220	.....	.....
	Kamiloloa 1.....	.....	* 490	.....
	Kamiloloa 2.....	.....	* 550	.....
	Makakupaia mauka.....	.....	* 490	.....
	Makakupaia makai.....	.....	.....	654
	Kawela.....	.....	.....	3,850
	Makolelau.....	.....	.....	253
	Kamalo.....	.....	.....	1,600
	Kapualei }	163	.....	923
	Kamueli }			
	Wawaia }			
	Puaahala.....	.....	.....	.....
	Kaamola.....	.....	.....	33
	Keawanui.....	.....	.....	182
	West Ohia.....	.....	.....	172
	East Ohia.....	.....	† 220	.....
	Manawai.....	.....	.....	416
	Kahananui.....	.....	† 182	.....
	Ualapue.....	.....	† 194	.....
	Kaluaaha.....	.....	.....	694
	Mapulehu.....	.....	.....	1,007
	Ilio Punaula.....	.....	.....	152
	Pukoo.....	124	.....	.....
	Kupehe.....	.....	.....	63
	Ahaino 1.....	96	.....	.....
	Ahaino 2.....	.....	.....	100
	Honomuni.....	.....	.....	415
	Kawaikapu (Gr.).....	.....	.....	67
	Kainalu.....	.....	.....	572
	Puelehe.....	.....	.....	14
	Puniuohua 1.....	.....	.....	2
	Puniuohua 2.....	.....	.....	2
	Waialua.....	.....	.....	627
	Moanui.....	.....	.....	282
	Honouliwai.....	378	.....	.....
	Honoulimaloo.....	.....	.....	175

\* Lease expires May 14, 1919.

† “ “ Aug. 17, 1923.

† “ “ Jan. 1, 1925.

## ISLAND OF MOLOKAI—Continued.

Reserve	Name of Land	Government Land		Private Land, Acres
		Unleased, Acres	Leased, Acres	
	Brought forward.....	2,602	2,126	.....
	Lupehu.....	.....	.....	83
	Pohakupili.....	.....	.....	9
	Mokea.....	.....	.....	218
	Keopukanuku.....	.....	.....	16
	Keopukaloa.....	.....	.....	810
	Halawa.....	.....	.....	7,190
	Wailau.....	.....	\$ 8,540	.....
	Pekikunu.....	.....	.....	4,512
	Waikolu.....	.....	.....	3,400
	Makanalua.....	.....	.....	142
	Kahanui G. 3539.....	.....	.....	215
	Totals for Molokai.....	2,602	10,666	31,406

§ Lease expires June 28, 1923.

## ISLAND OF MAUI.

Reserve	Name of Land	District	Government Land		Private Land, Acres
			Unleased, Acres	Leased, Acres	
West Maui.....	Ukumehame & Olowalu.....	Lahaina.....	7,655	.....	.....
	Launiupoko.....	".....	.....	.....	1,455
	Puehuehu.....	".....	.....	.....	440
	Kauaula.....	".....	.....	.....	1,455
	Kuia, Panaewa & Paunau.....	".....	2,100	.....	.....
	Paunau.....	".....	.....	.....	210
	Kuholilea.....	".....	.....	.....	120
	Puiki.....	".....	205	.....	.....
	Halakaa.....	".....	.....	.....	255
	Wahikuli.....	".....	1,550	.....	.....
	Hanakao.....	".....	.....	.....	720
	Honokawai.....	Kaanapali.....	1,410	.....	.....
	Kahana & Mahinahina.....	".....	.....	.....	330
	Mailepai.....	".....	.....	.....	120
	Alaeloa.....	".....	.....	.....	30
	Honokahua, Honolu & Honokohau..	".....	.....	.....	5,720
	Kahakuloa.....	".....	5,900	.....	.....
	Waihee.....	Wailuku.....	.....	.....	4,220
	Kou.....	".....	.....	* 285	.....
	Hananui.....	".....	.....	.....	200
	Waiehu.....	".....	.....	.....	1,190
	Wailuku.....	".....	.....	.....	4,935
	Waikapu.....	".....	.....	.....	3,935
	Polipoli, Waiehu....	".....	42	.....	.....
			18,862	285	25,335
Kula.....	Papaanui.....	Honuaula.....	370	.....	.....
	Kamaole.....	Kula.....	612	.....	.....
	Waiohuli-Keokea...	".....	2,450	.....	.....
	Kaonoulu.....	".....	.....	.....	804
	Alae 1 & 2.....	".....	.....	.....	202
	Alae 2 and 3.....	".....	70	.....	.....
	Waiakoa.....	".....	1,567	.....	.....
			5,069	.....	1,006
Waihou Spring...	Makawao.....	Hamakuapoko.	74	.....	.....
	Makawao.....	".....	.....	.....	10
			74	.....	10

\* Lease expires June 14, 1919.



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ISLAND OF MAUI—Continued.

Reserve	Name of Land	District	Government Land		Private Land, Acres
			Unleased, Acres	Leased, Acres	
Makawao.....	Makawao.....	Hamakuapoko.	2,093	.....	.....
Koolau.....	Opana° }	Hamakualoa...	.....	.....	10,899
	Peahi° }		.....	.....	.....
	Haiku° }		.....	.....	1,840
	Halehaku °.....	“ .....	.....	.....	.....
	Honopou W. Ma-	“ .....	.....	.....	.....
	kaiwa.....		4,800	.....	.....
	E. Makaiwa-	Koolau .....	.....	.....	.....
	Keopuka.....		1,400	.....	.....
	Honomanu.....	“ .....	2,000	.....	.....
	Keanae, mauka.....	“ .....	.....	† 8,750	.....
	Wailua 1 & 2.....	“ .....	.....	† 1,280	.....
	Wailua-Ulaine.....	“ .....	.....	† 3,000	.....
	Wailua-Ulaine.....	“ .....	9,000	.....	.....
			17,200	13,030	12,739
Hana.....	Hana Forest.....	Hana.....	11,572	.....	.....
	W. Honomaele.....	“ .....	.....	.....	187
	E. Honomaele.....	“ .....	130	.....	.....
	Kawela-Kaeleku.....	“ .....	65	.....	.....
	Wakiu.....	“ .....	15	† 3	.....
	Aleamai.....	“ .....	.....	.....	357
	Haneoo.....	“ .....	.....	.....	84
	Kakio.....	“ .....	700	.....	.....
	Waiohonu.....	“ .....	33	.....	.....
	Puukai-Papahawa-	“ .....	.....	.....	.....
	hawa.....		68	.....	.....
	Muolea.....	“ .....	.....	.....	430
	Koali Puuhaoa.....	“ .....	600	.....	.....
	Wailua.....	“ .....	270	.....	.....
	Puaaluu.....	“ .....	310	.....	.....
			13,764	3	1,058
Kipahulu.....	Kaumakani-	Hana.....	.....	.....	.....
	Papauluana.....		550	.....	.....
	Alaeiki.....	“ .....	180	.....	.....
	Alaenui.....	“ .....	.....	.....	5,705
	Kakahale-Kikoo.....	“ .....	98	.....	.....
	Kukuiula.....	“ .....	797	.....	.....
	Kukuiula (Grs.).....	“ .....	.....	.....	295
	Kaniaula.....	Kaupo.....	2,975	.....	.....
			4,600	.....	6,000
	Totals for Maui.....		61,662	13,318	46,148

† Lease expires Feb. 26, 1923.

° Surrendered to custody of Board of Agriculture and Forestry, Nov. 12, 1906, for the period to Feb. 26, 1923, under provisions of Sec. 490, R. L. H. 1915.

‡ Lease expires May 2, 1920.

## ISLAND OF HAWAII.

Reserve	Name of Land	District	Government Land		Private Land, Acres
			Unleased, Acres	Leased, Acres	
Kohala Mt.....	Awini.....	Kohala.....	.....	.....	500
	Awini.....	".....	100	.....	.....
	Honokane.....	".....	.....	.....	5,410
	Pololu.....	".....	1,000	.....	.....
	Makanikahio 1.....	".....	.....	.....	64
	Makanikahio 2.....	".....	.....	.....	71
	Waipuka.....	".....	.....	.....	197
	Niulii.....	".....	.....	.....	560
	Makapala.....	".....	.....	.....	530
	Aamakao.....	".....	.....	.....	710
	Halawa.....	".....	.....	.....	493
	Halelua.....	".....	.....	.....	15
	Nunulu.....	".....	.....	.....	38
	Lamalaloa-Kai-Holena.....	".....	.....	.....	140
	Lamaloloe.....	".....	24	.....	.....
	Kawaihae 1.....	".....	3,370	.....	.....
	Kawaihae 2.....	".....	.....	.....	120
	Puukawaiwai-Pano-luukia-Kapia.....	".....	360	.....	.....
	Pauahi.....	".....	150	.....	.....
	Momoualoe.....	".....	130	.....	.....
	Ouli.....	".....	.....	.....	190
	Lanikepu.....	".....	.....	.....	25
	Lanikepu.....	".....	435	.....	.....
	Waikoloa.....	".....	.....	.....	250
	Puukapu.....	".....	8,385	.....	.....
	Waipio.....	Hamakua.....	.....	.....	3,560
	Lalakea.....	".....	.....	.....	1,540
	Kukuihaele.....	".....	.....	.....	10
	Waikoekoe.....	".....	.....	.....	1,000
	Kamoku.....	".....	.....	* 20	.....
	Keaa.....	".....	.....	* 230	.....
			13,954	250	15,423
Hamakua-Pali....	Muliwai.....	Hamakua.....	3,575	.....	.....
	Waimanu & Laupahoe 1.....	".....	4,943	.....	.....
	Waimanu kuleanas.....	".....	.....	.....	61
	Waimanu homstds.....	".....	.....	.....	196
	Waimanu.....	".....	.....	° 200	.....
	Laupahoe 2.....	".....	.....	.....	2,350
	Nakooka.....	".....	1,640	.....	.....
	Apua.....	".....	1,260	.....	.....
	Waikapu.....	".....	1,980	.....	.....
	Honopue.....	".....	2,220	.....	.....
	Awini.....	".....	515	.....	.....
			16,133	200	2,607

\* Lease expires Sept. 8, 1928.

° " " Nov. 22, 1922.

## ISLAND OF HAWAII—Continued.

Reserve	Name of Land	District	Government Land		Private Land, Acres
			Unleased Acres	Leased Acres	
Hauola.....	Hauola.....	Hamakua.....	7	.....	.....
Mauna Kea.....	Kaohe.....	Hamakua.....	66,600	.....	.....
Hilo.....	Humuula.....	Hilo.....	3,901	.....	.....
	Kahōāhuna.....	“.....	46	.....	.....
	Waipunalei.....	“.....	.....	.....	1,470
	Laupāhoehoe- Weloka.....	“.....	11,845	.....	.....
	Maulua.....	“.....	.....	.....	7,989
	Waikumalo-Maulua..	“.....	790	.....	.....
	Piha.....	“.....	3,780	.....	.....
	Nanue.....	“.....	.....	.....	145
	Honohina.....	“.....	.....	.....	5,555
	Opea-Peleau.....	“.....	230	.....	.....
	Umauma.....	“.....	.....	.....	1,561
	Kamaee-Wailua.....	“.....	930	.....	.....
	Hakalau.....	“.....	.....	.....	9,826
	Wailea-Kaiwiki.....	“.....	3,834	.....	.....
	Honomu-Kuhua.....	“.....	926	.....	.....
	Makahānaloa.....	“.....	.....	.....	3,949
	Onomea.....	“.....	.....	.....	773
	Kahālii.....	“.....	.....	.....	183
	Papaikou.....	“.....	.....	.....	10,269
	Pāhoehoe.....	“.....	.....	.....	176
	Paukaa.....	“.....	.....	.....	6,221
	Kikala.....	“.....	.....	.....	90
	Kalalau.....	“.....	.....	.....	918
	Pūneo.....	“.....	.....	.....	436
	Piīhonua.....	“.....	.....	*33,941	.....
	Punahoa.....	“.....	.....	.....	216
			26,282	33,941	49,777
Upper Waiakea..	Piīhonua.....	“.....	.....	* 3,800	.....
	Waiakea.....	“.....	51,200	.....	.....
			51,200	3,800	.....

\* Lease expires March 21, 1921.

## ISLAND OF HAWAII—Continued.

Reserve	Name of Land	District	Government Land		Private Land, Acres
			Unleased, Acres	Leased, Acres	
Panaewa.....	Waiakea.....	Hilo.....	1,750	.....	.....
Olaa.....	Olaa.....	Puna.....	11,144	.....	.....
	Olaa.....	“.....	.....	\$ 8,589	.....
	Olaa.....	“.....	.....	† 99	.....
	Olaa.....	“.....	.....	† 100	.....
	Olaa.....	“.....	.....	† 98	.....
			11,144	8,886	
Upper Olaa.....	Olaa.....	Puna.....	9,280	.....	.....
Olaa Forest Park..	Olaa.....	Puna.....	531	.....	.....
Puna.....	Makuu-Kaohe.....	Puna.....	18,350	.....	.....
	Kaimu-Kehena.....	“.....	.....	.....	.....
	Kapaahu Kamaili....	“.....	1,500	.....	.....
			19,850	.....	.....
Keauohana.....	Keauohana.....	Puna.....	272	.....	.....
Kau.....	Puumakaa-Kiolakaa.....	Kau.....	.....	5,750	.....
	Waiohinu.....	“.....	10,740	.....	.....
	Kahilipalinui.....	“.....	.....	.....	165
	Kawala-Kaunamano..	“.....	380	.....	.....
	Kioloku.....	“.....	216	.....	.....
	Hionaa-Hokukano....	“.....	.....	.....	.....
	Mauka.....	“.....	345	.....	.....
	Kaalaiki.....	“.....	10,705	.....	.....
	Hilea-nui.....	“.....	.....	.....	2,620
	Hilea-iki.....	“.....	.....	.....	37
	Ninole Wailau.....	“.....	6,140	.....	.....
	Punaluu.....	“.....	.....	.....	1,275
	Mohokey 1 & 2.....	“.....	1,876	.....	.....
	Moaula-Kopu-Makaka.....	“.....	7,382	.....	.....
	Moaula-Kopu-Makaka.....	“.....	.....	46	.....
	Paauau 2.....	“.....	.....	.....	1,675
	Kaauhuhuula.....	“.....	3,069	.....	.....
	Keaiwa.....	“.....	.....	.....	483
	Kaalaala-Makakupu..	“.....	7,204	.....	.....

§ Lease expires Feb. 5, 1932.

† “ “ Nov. 22, 1932.

‡ “ “ May 24, 1923.

† “ “ May 29, 1932.

|| “ “ June 16, 1921.



## ISLAND OF HAWAII—Continued.

Reserve	Name of Land	District	Government Land		Private Land, Acres
			Unleased Acres	Leased Acres	
Kau.....	Brought forward....	Kau.....	47,997	5,796	6,255
	Kapapala.....		7,046	.....	.....
			55,043	5,796	6,255
South Kona.....	Kaohe Tract.....	S. Kona.....	1,555	.....	.....
	Kaohe 4.....	".....	.....	.....	760
	Kukuiopae Tract....	".....	2,700	.....	.....
	Olelomoana 1.....	".....	.....	.....	810
	Oleomoana-				
	Opihiali.....	".....	1,485	* 2,400	.....
	Kipahoehoe.....	".....	4,590	.....	.....
	Honomalino.....	".....	2,540	.....	.....
	Kapua.....	".....	.....	.....	6,122
	Kaulanamauna.....	".....	2,060	.....	.....
	Manuka.....	Kau.....	11,870	.....	.....
			26,860	2,400	7,692
Honuaula.....	Honuaula.....	N. Kona.....	665	.....	.....
Waiaha Spring...	Waiaha 2.....	N. Kona.....	193	.....	.....
	Totals for Hawaii.....		299,764	55,273	81,754

\* Lease expires June 9, 1926.

## SUMMARY.

	No. of Reserves.	Government Acres.	Private Acres.	Total Acres.	Percent.
Kauai . . . . .	8	81,325	66,888	148,213	18
Oahu . . . . .	15	34,045	33,888	67,933	8
Molokai . . . . .	1	13,268	31,406	44,674	6
Maui . . . . .	7	74,980	46,148	121,128	15
Hawaii . . . . .	16	355,037	81,754	436,791	53
Totals . . . . .	17	558,655	260,084	818,739	100
		68%	32%		

## Division of Forestry

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of February, 1919:

### BIENNIAL REPORT.

The biennial report of the division for the period ended December 31, 1918, was completed early in the month and handed to the printers for publication along with the reports of the other divisions.

### FOREST PLANTING.

During the first part of the month the tree planters on the Luaualei Forest Reserve set out 600 koa and 325 yellow poinciana trees near Kolekole Pass in the Waianae Mountains, before they moved over to Keaau Valley to begin the construction of a fence there.

On February 6, communications were addressed to the American Consul and the Government Botanist at Taihoku, Formosa, in the effort to secure through them a small quantity of seed of *Acacia confusa*, a tree which is used extensively in Formosa for planting along roadsides and as windbreaks in the tea districts, which is the chief source of wood for fuel and charcoal and which, it is thought, might be a valuable addition to the flora of these islands.

### INTER-ISLAND SHIPMENT OF PLANTS.

After several conferences with Commissioner Giffard and the Entomologist and Chief Plant Inspector, I have come to the conclusion that the best interests of our native forests on the other islands would be better safeguarded if the practice of shipping young forest tree seedlings from the government nursery in Honolulu to the other islands were discontinued and in its place a plan substituted for raising the trees for any island on that same island. Sec. 5 of Rule XVII of the Division of Entomology prohibits the shipping of plants or soil attached to plants from one island to another but there is a proviso that this may be done if they have been fumigated or sterilized and certified by the proper inspector to be free from insects and pests. Under this proviso, our plants have been raised and shipped to the other islands in sterilized soil but entomologists tell me that even this is not a panacea for the possible transmission of injurious insects and plant diseases. During 1918, the Government Nursery in Honolulu shipped at least 19,000 young tree seedlings to Kauai, 61,612 to Maui, and 3760 to Hawaii, while 153,150 were distributed on Oahu. It would seem that this small demand for young trees on the other islands could readily be met by raising them for Kauai and Hawaii at the sub-nurseries on each of those two islands respectively, and for Maui by establishing a new sub-nursery under the direction of Ranger Lindsay at Haiku. Plans to put this new scheme into effect will soon be laid before you.

### FOREST PROTECTION.

Early in the month, on the recommendation of Ranger Mackenzie, announcement was made that no more permits would be issued for the present for hunting wild pigs on the new Olaa Forest Reserve on Hawaii. Before December 31, 1918, when the land came under the jurisdiction of the Board, crowds of Portuguese and others from Hilo were in the habit of going into the woods after pigs, and since then the few permittees who received permits took with them large parties who cut trails and otherwise

damaged the forest. On the ground that more damage was done than benefit received by the removal of wild pigs the plan of issuing pig hunting permits on this reserve was discontinued.

In view of the announced revival of tramping trips in the mountains back of Honolulu, a letter was on February 15 addressed to the Trail and Mountain Club outlining the duty of this Board in the protection of the native forest on watershed areas and reminding them of the requirement, contained in Rule II, for securing permission before any new trails are constructed on government land in a forest reserve.

On February 1, Daniel Kapahu began his duties as forest ranger for the protection of forest reserves in the Waianae District in place of John Pililaau, resigned.

#### KOKEE CAMPS.

During the month, in accordance with authority granted at the Board meeting of January 21, and previously, camping permits were issued to the following to occupy for ten years camp sites in the Kokee Region in the Na Pali-Kona Forest Reserve, Kauai:

<i>Camp</i>	<i>Area, Acres</i>
1 G. F. Rankin .....	.5
12 T. Brandt .....	1.7
15 Wm. Danford .....	1.8
21 Kumuwela Camping Club .....	.4
27 H. N. Browne .....	.7
28 Mrs. B. D. Baldwin .....	.5
46 A. R. Glaisyer .....	.7

The sum of \$54.80 has been received from the permittees as payment in advance for the remaining portion of 1919 for fees in connection with these permits at the rate of \$10 per acre per annum and has been turned into the special fund which is available for the protection and extension of forest reserves.

On February 8, the construction of a new bridge across the Waineke Stream in this same region at a cost of \$72 was completed to replace the old one which had fallen through. During the early part of the month the cabin on the Kokee Ranger Station was also completed.

#### FOREST FENCING.

The construction of the new fence at Keaau, Oahu, on the boundary of the Makua-Keaau Forest Reserve, adjacent to Lot 1, of the Keaau Homesteads was begun on February 14, in cooperation with the occupant of Lot 1, Mr. L. P. Fernandez, who is paying half the cost. On the last day of the month it was inspected and found to be built in a substantial manner and almost completed. It will be a little short of one mile in length.

On February 20, in company with a government surveyor, a visit was made to the Kuaokala Forest Reserve, Oahu, and several corners were located and flagged preliminary to the construction of a fence on its boundaries where needed to keep stock away from the native forest. On the previous day a part of the makai line of the Pupukea Forest Reserve was also located on the ground in company with the same surveyor who has since returned to complete the work.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, February 28, 1919.

DEAR SIR:—I herewith submit a report of the work done during the month of February:

## NURSERY.

*Distribution of Plants.*

	In Seed Boxes.	In Transplant Boxes.	Pot Grown.	Total.
Sold .....	....	....	43	43
Gratis .....	10,000	110	952	11,062
	<hr/> 10,000	<hr/> 110	<hr/> 952	<hr/> 11,105

## COLLECTIONS.

Collections on account plants sold .....	\$ 1.65
Rent of office, Nursery Grounds .....	35.00
	<hr/> \$36.65

## PLANTATION COMPANIES AND OTHER CORPORATIONS.

The distribution of plants under this heading amounted to 5,500 in transplant boxes and 2,000 pot grown, making a total of 7,500.

We have received an order for 60,000 seedlings to be delivered not later than September 1, 1919.

## MAKIKI STATION.

The work at this station has been principally routine, which consists of sterilizing and mixing soil, transplanting and potting plants, sawing-up wood, making boxes, etc.

## HONOLULU WATERSHED PLANTING.

The work done on the watershed consisted in making holes for trees, hoeing and clearing. About 3,000 koa trees are about ready at our nursery at the base of Sugar Loaf hill and 1,000 more at Makiki Station. We intend planting these in Opu Valley, where the holes are dug and ready for them.

The making of charcoal from the trees which were blown down during the last wind storm looks promising. About 50 bags of good-looking charcoal are ready for the market.

## ADVICE AND ASSISTANCE.

The writer paid a visit to Schofield Barracks at the request of Captain Atkinson for the purpose of giving advice in the starting of a nursery, tree planting, etc.

Requests for advice from people in and around Honolulu were as follows:

Calls made .....	4
Advice by telephone .....	8
Advice by letter .....	2
Advice to people calling .....	9

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.



## REPORT FOR MARCH.

Honolulu, Hawaii, April 7, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of March, 1919:

## BIENNIAL REPORT.

The biennial report for the period ended December 31, 1918, came off the press on March 17 and was on the following day placed in the hands of the members of the Legislature. Besides containing detailed statements and photographic illustrations of the work of the Division of Forestry, it contains maps of the five main islands, showing in green the completed forest reserve system.

## FOREST FENCING.

Progress in fencing forest reserve boundaries to prevent damage by stock was made by the completion of the following projects:

*Moloaa Forest Reserve, Kauai.*—The Fence on the boundary adjacent to Papaa-Moloaa Pasture Lot 1, was repaired and put in stock-proof condition by Mr. C. A. Rice in accordance with the fencing requirements in General Lease No. 792. The work on this three mile stretch of fence was completed on February 19.

*Makua-Keaau Forest Reserve, Oahu, Keaau Section.*—The fence crossing Keaau Valley, .84 mile in length, was completed on March 3. Mr. L. P. Fernandez paid for half the cost of the fence where it is on the mauka boundary of Lot 1 of the Keaau Homesteads.

*Makua Section.*—The fence across Makua Valley, 1.07 miles in length, has at last been constructed by Mr. L. L. McCandless and was completed on March 25. The fence is well built and will serve to protect most of the native forest in Makua Valley from the ravages of stock. This is the fence which should have been completed on June 4, 1914, in accordance with the fencing requirements in General Lease No. 730.

*Kau Forest Reserve, Hawaii.*—A new fence, slightly over one mile in length, was constructed on the Kiolakaa boundary under the fencing requirements of General Lease No. 550 by the Hutchinson Plantation Co. and was completed on February 15.

On March 13 another visit was made with a government surveyor to the Kuaokala Forest Reserve, Oahu, and further boundary corners were located and flagged. At the present time, cattle under a tenancy-at-will are on the adjacent unreserved government land of Kuaokala and wander on to this reserve with destructive results to the native forest. The need for fencing the boundaries of this reserve, which is a source of supply for water, is immediate. After consultation with the President of this Board and the Commissioner of Public Lands, it has been decided to offer the sale of a lease of the unreserved government land of Kuaokala, containing approximately 2,000 acres, the lease to contain a clause requiring the immediate fencing of the adjacent forest reserve. The government surveyor is preparing a new map of this land for this purpose.

At my request the government surveyor has also recently completed a new map of the Hilo Forest Reserve, Hawaii, which will be used this summer in investigating the need of fencing the makai boundary above the Hilo coast sugar plantations.

An investigation by Ranger Hardy brought out the fact that there has been unlawful grazing on the government land of Kalaeo in the Lihue-Koloa Forest Reserve, Kauai, by one Henry Kinney, who pastures cattle on a wet land kuleana just within the fenced boundary and which naturally wanders on to other parts of the reserve. Mr. Kinney has been notified to stop this trespass immediately and through Mr. W. D. McBryde I am ar-

ranging for the construction of an additional short stretch of fence which will absolutely prevent further trespass.

#### FOREST PROTECTION.

Progress has been made in clearing up the debris caused by the December storm in the eucalyptus forest on Tantalus by converting a part of the fallen trees into charcoal and by the cutting and removal of a large part of the wood by prisoners for use at the Oahu penitentiary.

District Forester James Campsie recently caused the arrest of two Japanese who, in violation of Paragraph (b) of Rule II of the Division of Forestry, had live stock without permit on the Kau Forest Reserve near the waterheads in Wood Valley. Each was given a suspended sentence of 13 months by the district magistrate.

On March 21, I attended a luncheon with members of the Trail and Mountain Club and explained my position and the regulations concerning trail construction on government lands in forest reserves. The club has assured me that the regulations will be observed and has gone further and extended the courtesy of directing that all new trail projects on private lands will first be referred to me for approval.

#### TREE PLANTING.

During the month 260 highland ironwood trees were planted by the fencing gang along the newly fenced boundary crossing Keaau Valley, Oahu, in order to mark the boundary in a distinctive manner and to serve as fence posts in the future.

On the Kealia Forest Reserve, Kauai, Ranger Lovell planted 92 swamp mahogany trees in February and 145 trees of the same species in March.

On the Honolulu Watershed Reserve, Oahu, 735 koa and 305 mahogany trees were set out as replants in fail places.

In response to a request forwarded by Governor McCarthy from Mr. T. Goffart, a French official at Tangier, Morocco, who has made a specialty of assembling and planting a great number of different kinds of acacia trees in that country, it was a pleasure to dispatch packets of seeds of three of our different koa trees, as follows: *Acacia koa*, Asa Gray, from Oahu, el. 1,200 feet; *Acacia kauaiensis*, Hillebrand, from Kauai, el. 3,500 feet; and *Acacia koa hawaiiensis*, Rock, from Hawaii, el. 6,000 feet.

From Consulting Botanist J. F. Rock a few seeds of *Taiwania cryptomerioides* have been received and planted. This is a timber tree of Formosa resembling the sequoias of California.

Pursuant to the plan, outlined in my February report, for discontinuing the sending of tree seedlings from the Oahu nurseries to the other islands, Mr. Haughs went to Hilo on March 19 and conferring for two days with Bro. Matthias Newell made arrangements for handling at his sub-nursery all future orders for trees required on Hawaii. Mr. Haughs will visit Maui in April to make similar arrangements with Ranger Lindsay at Haiku.

#### PUU KA PELE PARK.

Subsequent to the Board meeting of March 10, at which the withdrawal of 415 acres from the Puu Ka Pele Forest Reserve, Kauai, was approved, for the purpose of making it available as a public park to be under the control of the County of Kauai, the Governor signed a notice of public hearing on April 2, to consider the withdrawal, which has been published.

#### ALGAROA VOLUME TABLE.

The December storm which blew down so many algaroba trees in the Punahou District, Honolulu, afforded an opportunity of preparing a volume table to show the amount of cordwood in standing algaroba trees of differ-

ent diameters. This has been printed in the March FORESTER and will doubtless be found useful to owners of algaroba lands. The table has been checked by a leading dealer in algaroba cordwood, who finds that the figures conform closely to those obtained in his operations.

#### LIST OF LANDS IN FOREST RESERVES.

In response to the request contained in House Resolution No. 59 of the Legislature now in session, I prepared and transmitted to the Speaker of the House on March 28 a list showing the area and location of all unleased and leased government and private lands in the forest reserves throughout the Territory together with all available data as to whether the boundaries of these lands were protected by fences. In checking up the areas at the government survey office, several corrections were made in areas on account of more correct map computations. It was found that there were actually 3,200 acres, more than previously reported, in the government land of Piihouna within the Upper Waiakea Forest Reserve, Hawaii, and 460 acres more in the government lands of Ninole-Wailau and 568 acres more in the government land of Kaauhuhuula within the Kau Forest Reserve, Hawaii. Since the preparation of this list, 415 acres have been withdrawn from the Puu Ka Pele Forest Reserve, Kauai. These operations have changed the total acreage in forest lands, as given on pages 24 and 25 of the 1918 biennial report, by adding a net area of 3,813 acres. The acreage of forest reserve lands on April 7, 1919, is therefore as follows:

	Government.	Private.	Total.	Per Cent.
Kauai . . . . .	81,325	66,888	148,213	18
Oahu . . . . .	34,045	33,888	67,933	8
Molokai . . . . .	13,268	31,406	44,674	6
Maui . . . . .	74,980	46,148	121,128	15
Hawaii . . . . .	355,037	81,754	436,791	53
Totals . . . . .	558,655	260,084	818,739	100

#### HAWAII TRIP.

At the request of the Chairman of the Public Lands Committee of the House of Representatives I accompanied his party and the Commissioner of Public Lands on an official trip to Hilo on March 29, and while there gave my ideas as to the advisability of extending the boundary of the Hilo Forest Reserve further makai on the government land of Piihouna so as to give greater protection to the extension of the source of water supply for Hilo.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

#### FOREST NURSERYMAN'S REPORT.

Honolulu, Hawaii, March 31, 1919.

Superintendent of Forestry, Honolulu.

DEAR SIR:—I herewith submit a report of the principal work done during the month of March:

#### NURSERY.

##### *Distribution of Plants.*

	In Seed Boxes.	In Transplant Boxes.	Pot Grown.	TOTAL.
Sold . . . . .	.....	.....	463	463
Gratis (including Gov. Forest Reserves) . . . . .	17,500	2,150	1,603	21,253
	17,500	2,150	2,066	21,716

## COLLECTIONS.

*Government Realizations for March.*

Collections on account of sale of plants.....	\$ 5.90
Rent of office building, Nursery Grounds for January.....	35.00
	<hr/>
	\$ 40.90

*Preservation of Forest Reserves.*

Collections for quarter ending March 31, 1919, 31 loads black sand at 50c. ....	\$ 15.50
Fees for camp sites, Kokee Camp, Na Pali-Kona Forest Reserve, Kauai, to Dec. 31, 1918 .....	56.15
Sale of 63¾ cords dead Ohia wood, Sec. C, Upper Olaa Forest Reserve, along Volcano Road, Hawaii, at \$1 per cord.....	63.75
Rent Half-way House, Tantalus, Jan., Feb. and March.....	30.00
Rent small piece of land Pauoa Valley at 25c per month, March 31, 1918, to March 31, 1919 .....	3.00
Fee for use of land and gathering ti leaf, Pauoa Valley.....	12.50
	<hr/>
Total .....	\$180.90

*Plantation Companies and Other Corporations.*

Plants distributed during the month amounted to 2,000 in seed boxes. We have orders on file amounting to 60,000 seedlings and 8,500 transplants.

*Makiki Station.*

The work done at this station has been principally routine, namely, cutting up wood for boxes, fence posts, etc., mixing and sterilizing soil, transplanting seedlings and attending to the plants on hand.

*Honolulu Watershed Planting.*

Trees transplanted during the month amounted to 735 koa, which were planted in Opu Valley. Other work done consisted in making holes and clearing away grass and weeds from the young trees.

*Advice and Assistance.*

The writer paid a visit to Hilo for the purpose of making arrangements with Bro. Matthias in regard to increasing the size of the Hilo Nursery, so that enough trees could be kept in stock to supply the Island of Hawaii. The work of propagating the necessary trees will commence at once.

The writer has been called upon to give advice as follows: Calls made, 4; advice by phone, 4; advice given people calling, 6.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.



# Division of Entomology

Honolulu, Hawaii, February 28, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month of February the insectary handled 12,000 pupae of the melon fly, from which there were bred 1,269 females and 1,037 males, *Opius fletcheri*.

The distribution of parasites was as follows:

## MELON FLY PARASITES.

### *Opius fletcheri*.

OAHU:	Females.	Males.
Moiiliili .....	1,100	1,040

## FRUIT FLY PARASITES.

### *Diachasma fullawayi*.

OAHU:		
Nuuanu .....	60	40
Kaimuki .....	50	..
Makiki .....	200	..

### *Galsus silvestri*.

OAHU:		
Nuuanu .....	860	..

### *Tetrastichus giffardianus*.

OAHU:		
Kaimuki .....	350	
Nuuanu .....	150	
Makiki .....	200	

### *Diachasma tryoni*.

OAHU:		
Kaimuki .....	210	75
Nuuanu .....	110	35
Makiki .....	200	35

### *Opius Humilis*.

OAHU:		
Kaimuki .....	140	30
Nuuanu .....	80	80
Makiki .....	200	..

## DUNG FLY PARASITE.

### *Spalangia cameroni*.

MAUI:		
Paia .....		1750

## CORN LEAFHOPPER PARASITE.

OAHU:		
Kailua .....		2000
Makiki Nursery .....		1700

KAUAI:		
Lihue	.....	5000
Kealia	.....	1000

Respectfully yours,

DAVID FULLAWAY,  
Entomologist.

## REPORT FOR MARCH.

Honolulu, Hawaii, April 8, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

GENTLEMEN:—During the month of March the insectary handled 3,100 pupae of the melon fly, from which there were bred 547 females and 661 males, *Opius fletcheri*.

The distribution of parasites was as follows:

### MELON FLY PARASITE.

#### *Opius fletcheri*.

OAHU:		<i>Females.</i>	<i>Males.</i>
Kaawa	.....	400	210
HAWAII:			
Hilo	.....	100	100

### FRUIT FLY PARASITES.

#### *Diachasma fullawayi*.

OAHU:			
Makiki	.....	100	50
Nuuanu	.....	25	25
Kaimuki	.....	50	25
Kalihi	.....	50	50

#### *Diachasma tryoni*.

OAHU:			
Makiki	.....	100	75
Nuuanu	.....	50	50
Kaimuki	.....	50	25
Kalihi	.....	125	125

#### *Tetrastichus giffardianus*.

OAHU:		
Makiki	.....	225
Kaimuki	.....	200
Kalihi	.....	400

#### *Opius humilis*.

OAHU:			
Makiki	.....	100	100
Manoa	.....	25	25
Nuuanu	.....	80	80
Kaimuki	.....	100	75
Kalihi	.....	125	125

*Dirhinus giffardi.*

OAHU:  
Kalihi . . . . . 100

## DUNG FLY PARASITE.

*Spalangia cameroni.*

MAUI:  
Paia . . . . . 600

## CORN LEAF HOPPER PARASITE.

*Paranagrus osborni.*

OAHU:  
Makiki Nursery . . . . . 6,800

Respectfully submitted,

DAVID FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, Feb. 28, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of February, 1919, as follows:

During the month 57 vessels arrived at the Port of Honolulu, 23 of which carried vegetable matter. Nine came via the Panama Canal. The following disposal was made of the various shipments:

	<i>Lots.</i>	<i>Parcels.</i>
Passed as free from pests . . . . .	415	14,341
Burned . . . . .	67	75
Fumigated . . . . .	5	26
Returned . . . . .	1	1
Total Inspected . . . . .	488	14,443

Of these shipments, 14,173 packages arrived as freight, 160 packages as mail and 110 packages as baggage.

## RICE AND BEAN SHIPMENTS.

During the month 14,171 bags of rice and 2,577 bags of beans from Japan were inspected and found free from infestation.

## PESTS INTERCEPTED.

Approximately 4,738 pieces of baggage belonging to passengers and immigrants from foreign ports were examined, from which 40 lots of fruit and 24 lots of vegetables were taken and destroyed.

On February 22 a small shipment of orchids and chrysanthemums from Japan were fumigated as a precautionary measure and passed. On the same date one maple tree, two ornamental plants and four orange trees, taken from a passenger's baggage from Japan were burned. Orange trees are prohibited by law, and as the others were in the same package it was deemed advisable to destroy the whole lot.

The following disposal was made of mail parcels during the month:  
One package of ginger root from Manila, returned as unmailable.

Four packages of seed corn from Japan, burned, being a prohibited importation.

Three packages of tree seeds from Manila for Mr. J. F. Rock and the U. S. Experiment Station were fumigated as a precaution and released.

During the month of February we fumigated for the accommodation of local merchants:

	200 bags corn.
	29 bags beans.
	32 bags dried awa root.
Total.....	261 bags

#### HILO INSPECTION.

Brother M. Newell reports the arrival at Hilo of eight steamers, four of which carried vegetable matter consisting of 107 lots and 2,876 parcels, all of which were passed as free from pests. In addition, the S. S. "Kiyo Maru" arrived direct from Japan, bringing 7,720 bags of rice, 1,019 bags of beans and 9 bags of peanuts, which were found free from infestation.

#### KAHULUI INSPECTION.

Mr. Will Cooper, Inspector for Maui, reports the arrival of six vessels at the Port of Kahului, two of which carried vegetable matter, consisting of 42 lots and 1,192 packages, all of which were passed.

#### INTER-ISLAND INSPECTION.

Sixty-two steamers plying between Honolulu and other Island ports were attended and the following shipments were passed as free from pests:

Taro.....	712 bags
Vegetables.....	117 packages
Plants.....	101 "
Fruit.....	27 "
Total passed.....	957 packages

Three packages of plants and ten packages of fruit were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

E. M. FHRHORN,  
Chief Plant Inspector.

#### REPORT FOR MARCH.

Honolulu, Hawaii, March 31, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

GENTLEMEN:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of March, 1919, as follows:

During the month 79 vessels arrived at the Port of Honolulu, 26 of which carried vegetable matter. Nine came via the Panama Canal. The following disposal was made of the various shipments:



	<i>Lots.</i>	<i>Parcels.</i>
Passed as free from pests .....	934	26,466
Burned .....	44	44
Fumigated .....	8	58
Returned .....	1	5
	<hr/> 987	<hr/> 26,573

Of these shipments 26,244 packages arrived as freight, 188 packages as mail and 141 packages as baggage.

#### RICE AND BEAN SHIPMENTS.

During the month 31,220 bags of rice and 4,266 bags of beans arrived from Japan and were found free from dangerous insect pests.

#### PESTS INTERCEPTED.

Approximately 5,687 pieces of baggage belonging to immigrants and passengers from foreign countries were examined, from which 31 lots of fruit and 11 lots of vegetables were taken and destroyed.

On March 8, one package of ornamental plants from Japan in the baggage was fumigated as a precaution and passed.

On March 13, five banana plants from Manila, being a prohibited importation, were refused landing.

On March 14, four ornamental plants from Japan were fumigated before delivery as a precautionary measure.

On March 23, 46 orchids in the baggage from Manila were fumigated as a precaution and passed.

On March 26, a number of chrysanthemum roots in the baggage from Japan were found to be infested with Lepidopterous borers and burned.

On the same date six ornamental trees in the baggage from Hong-kong were fumigated as a precaution and released.

On March 30, a bundle of taro plants from Porto Rico in the mail was burned, as there was evidence of a fungus disease.

On March 8, a package of tree seed in the mail from Egypt was fumigated with CS2 before delivery.

During the month 276 bags of corn and 5 bags of rice flour were fumigated for local merchants—a total of 281 bags.

#### HILO INSPECTION.

Brother M. Newell, Inspector at Hilo, reports the arrival of 11 vessels at the Port of Hilo, 3 of which carried vegetable matter, consisting of 47 lots and 1,393 packages. All were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Will Cooper, Inspector at Maui, reports the arrival of five vessels at the Port of Kahului, one of which carried vegetable matter, consisting of 14 lots and 439 packages. All shipments were in good condition and free from insect infestations.

#### INTER-ISLAND INSPECTION.

Sixty-two steamers plying between Honolulu and other Island ports were attended and the following shipments were passed as free from pests:

Taro.....	488 bags
Vegetables.....	202 packages
Plants.....	112 “
Fruit.....	44 “

Total passed..... 846 packages

Five packages of plants and four packages of fruit were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry

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Honolulu, Hawaii, March 7, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of February, 1919:

### RESIGNATION OF DEPUTY.

I beg to report that the Deputy Territorial Veterinarian for the Kohala and Kona district on the island of Hawaii has tendered his resignation, to take effect at the end of this month. This will leave the entire island in charge of Dr. Elliot at Hilo, unless the position can be filled by another veterinarian. For this purpose an effort will be made to ascertain the amount of financial support that can be obtained from the ranches and plantations in this district, which support, together with the monthly contribution from this Board, should amount to at least \$300.00 per month in order to induce a high class veterinarian to locate in this district. It will practically be impossible for Dr. Elliot to do all of the tuberculin testing on the Big Island, as it would require his absence from the plantations, with which he has contracts for weeks at a time. If, however, \$300.00 per month can be guaranteed, the insertion of an advertisement in the *American Veterinary Journal* would undoubtedly bring forth applications from which a good man might be selected.

### NEW REGULATIONS.

As the federal agricultural appropriation bill has now been passed, the Territory is assured of federal support in its efforts at eradicating bovine tuberculosis. It has, therefore, been found advisable to prepare a new set of rules and regulations governing the testing, slaughter, appraisal and indemnification for tuberculous cattle. These regulations will be presented for the approval of the Board as soon as the present Legislature has passed the Board of Agriculture's appropriation bill.

### ANTHRAX SERUM VACCINE.

The manager of the Princeville Plantation Company's ranch at Hanalei has made application for 3000 doses of anthrax serum vaccine for the annual immunization of the cattle on the said ranch. It is, therefore, important that funds should be obtained for the purchase of this vaccine or else that the Board should go on record as being opposed to the free distribution of serum and vaccine for this or any other disease. The matter is now up before the present Legislature and will undoubtedly be decided at an early date.

### IMPORTATIONS OF LIVE STOCK.

The manager of the Parker Ranch has again imported into the Territory a flock of fifty Merino rams of high class from New Zealand. The

animals all arrived in good condition and will no doubt help to improve the highly bred-up flocks of the said ranch.

Very respectfully,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

#### REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, Feb. 28, 1919.

Dr. V. A. Norgaard, Chief, Division of Animal Industry, Bureau of Agriculture and Forestry, Honolulu.

DEAR SIR:—I beg to submit the following report for the month of February:

##### TUBERCULOSIS CONTROL.

The following dairy cattle were tested during the month:

	Tested.	Passed.	Condemned.
Kamehameha Schools . . . . .	50	50	0

##### CONTAGIOUS EPITHELIONIA.

A few outbreaks of sorehead in chickens occurred during the month and about 1000 c.c. of vaccine was made up in the laboratory and distributed among various poultry owners.

##### IMPORTATIONS OF LIVE STOCK.

The following live stock landed at the port of Honolulu during the past month:

S. S. Enterprise, San Francisco: 2 ets. rabbits, 1 dog, Amer. Ry. Ex. Co.; 1 et. poultry, E. A. McNerny; 9 ets. poultry, various.

S. S. Anyo Maru, San Francisco: 2 ets. birds, 1 et. ducks.

S. S. Lurline, San Francisco: 15 mules, C. Brewer & Co.; 1 et. rabbits, Amer. Ry. Ex. Co.; 1 et. chicks, California Feed Co.

S. S. Venezuela, San Francisco: 2 dogs, Geo. C. Beckley.

Respectfully submitted,

LEONARD N. CASE,  
Asst. Territorial Veterinarian.

#### REPORT FOR MARCH.

Honolulu, Hawaii, April 8, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of March, 1919:

##### SWINE EPIDEMIC ON MAUI.

On March 8th a wireless from Dr. Fitzgerald announced a severe epidemic on a large hog ranch on Maui, stating that the mortality continued even after three vaccinations and requesting my presence without delay. By direction of the President of the Board I left that same afternoon for Maui.

Prom Dr. Fitzgerald, who took me to the ranch in question, I learned that at the time the outbreak began, a month or six weeks before, there were about 500 hogs of all ages on the place. No large number died at

one time, but a few, mostly weanling pigs, almost every day. Post-mortem examination showed typical lesions of swine plague or hemorrhagic septicemia. He immediately vaccinated all the animals in the infected pens with mixed infection bacterins, segregated the sick ones and disinfected. After a temporary lull fresh cases appeared and vaccination was repeated, and while quite a number of affected ones recovered, the mortality remained high. A third vaccination was finally resorted to, but at the time of my arrival about 150 head were dead, and among them a dozen valuable brood sows.

An examination of the premises showed that diligent measures had been taken in regard to cleanliness, disinfection, liming, segregation and disposal of the dead.

In the segregation pens one sow, two or three gilts and some weanling and suckling pigs were sick, while others were recovering. The principal symptoms were those observed in all the swine diseases—staggering gait, cough and diarrhoea. The cough was more prevalent among the pigs, the diarrhoea among the older ones.

Post-mortem examination of four recently dead cases, one sow, one shoat and two pigs, showed that while there was typical hemorrhagic septicemia lesions in the thoracic cavity of all, one only could possibly have died from the pneumonia. The others showed decided retrogressive lung symptoms. On the other hand, the large intestines were the seat of an extremely severe necrotic enteritis. Confluent diphtheritic and croupous membranes occupied practically the entire mucous surface, while irregular, well-defined areas, greatly thickened and consisting of greenish and yellow layers of necrotic tissue, indicated the penetration of the infection through the muscular coats to the serous or outer covering of the intestines. While no actual perforations were observed, diffuse peritonitis was not rare, and the dead yellow spots surrounded by hyperemic zones as seen on the outside of the intestines had every appearance of being on the verge of rupture.

The same conditions were found in practically all cases examined at subsequent visits, a preponderance of the necrotic enteritis symptoms, and as no effective vaccine has as yet been produced for this infection, it was decided to try medicinal treatment in the form of intestinal antiseptics.

For this purpose permanganate of potash has been recommended, and while at the present very expensive (\$3.90 per pound, as compared with 50c, pre-war price), a quantity was secured and all sick and exposed as well as recovering animals were submitted to continuous treatment by mixing one-half per cent of the permanganate with all feed mashes and with the molasses water which is constantly before them. No other drinking water was allowed.

After about one week of this treatment, Dr. Fitzgerald reported a decided improvement in a number of the sick ones, while the mortality had become greatly reduced.

The hog ranch in question is practically isolated, there being but one neighbor, who lost all of his hogs, nineteen, at the beginning of the outbreak. One dog, which had been overlooked, was disposed of and the quarantine established by Dr. Fitzgerald was suggested continued until further notice. There is consequently little to fear of the further spread of the disease. Both the bacillus suisepicus and the bacillus necrophorus are normally present in the respiratory and intestinal tracts of hogs as well as in their surroundings. As a rule they are harmless. What causes them, under apparently favorable sanitary and hygienic conditions, to become pathogenic (virulent) is not known.

#### ANTHRAX ON KAUAI.

Under date of March 27th, Dr. Golding reports the death from anthrax of a saddle horse in No. 2 paddock on the Princeville Plantation.

This is the first death from anthrax in ten months, and needs cause no alarm. Under date of March 17th, three thousand doses of anthrax serum



vaccine was ordered from San Francisco, and as soon as it arrives all the stock on the plantation will be vaccinated.

BILLS BEFORE THE LEGISLATURE.

Two bills for the indemnification of the Haleakala Ranch Co. and the Maui Agricultural Co. for expenditures in connection with the 1917 outbreak of anthrax have been prepared and are now awaiting action by the Legislature.

Respectfully submitted,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.

REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, March 31, 1919.

Dr. V. A. Nörsgaard, Chief, Division of Animal Industry, Bureau of Agriculture and Forestry, Honolulu.

SIR:—I beg to submit the following report for the month of March:

TUBERCULOSIS CONTROL.

The following dairy cattle were tested during the past month:

	Tested.	Passed.	Condemned.
S. K. Maii .....	4	3	1

The above condemned animal was found unfit for human consumption on post-mortem examination.

IMPORTATION OF LIVE STOCK.

During the past month 20 steamers were boarded, among which the following carried livestock:

S. S. Enterprise, San Francisco: 50 Merino rams, Hawaii Meat Co.; 10 mules, Schuman Carriage Co.

S. S. Tenyo Maru, Orient: 14 crates pheasants, E. O. Hall & Son.

S. S. Sachem, San Francisco: 1 dog, Lt. W. E. Bogardus; 10 crates poultry; 1 crate rabbits.

S. S. Airlie, San Francisco: 1 crate rabbits.

S. S. Nippon Maru, San Francisco: 1 dog, Mr. Rudin.

S. S. Salmon, San Francisco: 1 dog, owned by member of crew. Owner was instructed to keep dog confined on ship while in port.

S. S. Enterprise, San Francisco: 10 crates poultry.

S. S. La Brea, San Francisco: 1 parrot, J. Campbell.

Respectfully yours,

LEONARD N. CASE,  
Asst. Territorial Veterinarian.

## By Authority

### PROCLAMATION OF WITHDRAWAL OF CERTAIN LAND FROM THE PUU KA PELE FOREST RESERVE, DISTRICT OF WAI- MEA, ISLAND AND COUNTY OF KAUAI, TERRITORY OF HAWAII.

UNDER and by virtue of the authority vested in me by the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, and of every other power me hereunto enabling, I, C. J. McCARTHY, Governor of Hawaii, with the approval of a majority of the Board of Commissioners of Agriculture and Forestry, and of the Commissioner of Public Lands, having held the hearing of which notice has been duly given all as in said laws provided, do hereby WITHDRAW AND ELIMINATE from the Puu Ka Pele Forest Reserve, in the District of Waimea, Island and County of Kauai, Territory of Hawaii, created and set apart by Proclamation of the Governor of Hawaii on December 31, 1918, that certain portion of said reserve called Puu Ka Pele Park, more particularly described by and on maps made by the Government Survey Department of the Territory of Hawaii, which said maps are now on file in the said Survey Department marked Government Survey Reg. Map No. 2602 and "Puu Ka Pele Park," and a description accompanying the same numbered C. S. F. 3147, which said description now on file in the said Survey Department is as follows:

PUU KA PELE PARK,  
Waimea, Kauai,  
Within PUU KA PELE FOREST RESERVE,  
C. S. F. 3147.

Beginning at Government Survey Trig. Station "Puu ka Pele," marked by a 3" iron pipe set in concrete on the West edge of Waimea Canyon, as shown on Government Survey Registered Map No. 2602, and running by true azimuths:

1. Along the top of West edge of Waimea Canyon to a Forest Reserve Monument, the direct azimuth and distance being:  $343^{\circ} 16' 30''$  2778.4 feet;
2.  $68^{\circ} 39'$  1170.0 feet along lower line of Forest Reserve along government land;
3.  $154^{\circ} 43'$  12,255.2 feet along Puu ka Pele Forest Reserve;
4.  $270^{\circ} 00'$  1870.0 feet along same to + on point of stone on hill at top of pali, marked PARK;
5. Along top of West edge of Waimea Canyon to an exposed claw root of Koa tree (20 feet from tree with verticle root marked PARK), the direct azimuth and distance being:  $345^{\circ} 12'$  1473.7 feet;
6. Along same to an Ohia stake in mound of stones on brow of pali (the stone being marked PARK), the direct azimuth and distance being:  $351^{\circ} 42'$  730.2 feet;
7. Along same to a mound of stones around trunk of leaning Koa tree (the stone being marked PARK), the direct azimuth and distance being:  $313^{\circ} 05'$  1525.8 feet;
8. Along same to the point of beginning, the direct azimuth and distance being:  $336^{\circ} 49'$  5227.1 feet.

Area, 415 acres, more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and (Seal) caused the Great Seal of the Territory of Hawaii to be affixed.

DONE at the Capitol in Honolulu this 2nd day of April,  
A. D. 1919.

C. J. McCARTHY,  
Governor of Hawaii.

By the Governor:

CURTIS P. IAUKEA,  
Secretary of Hawaii.

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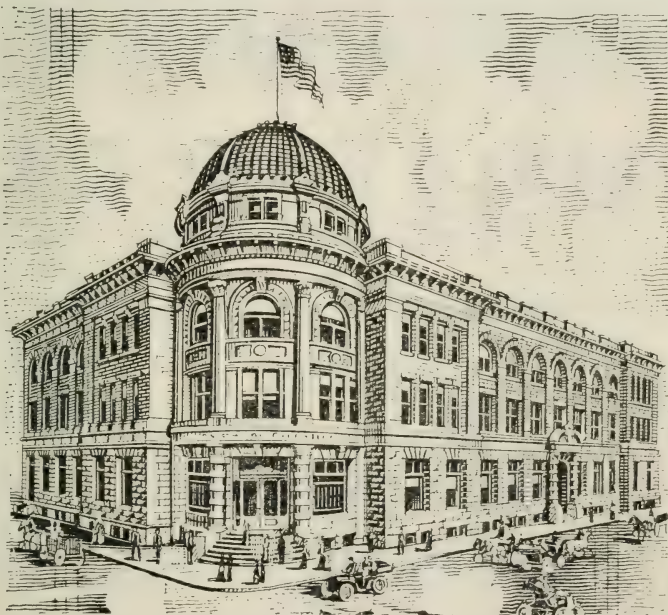
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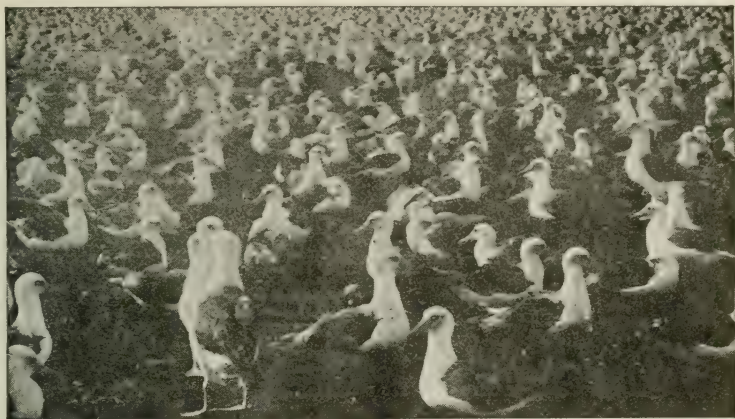
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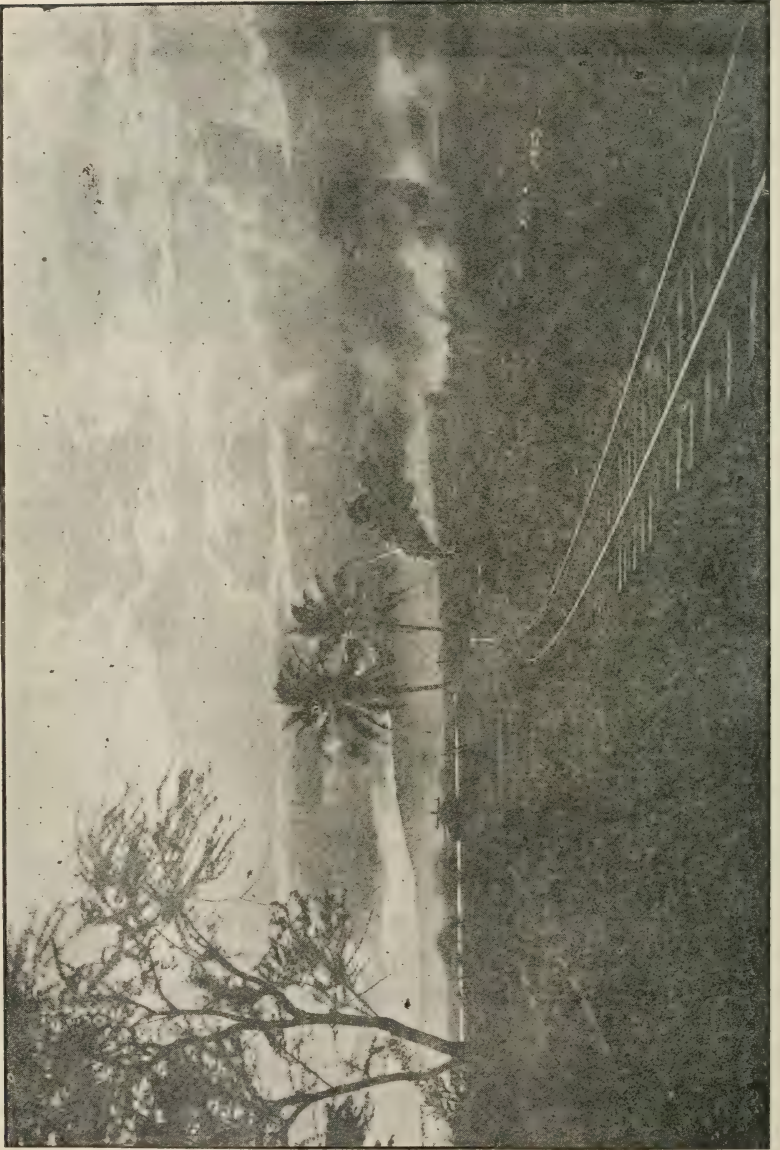
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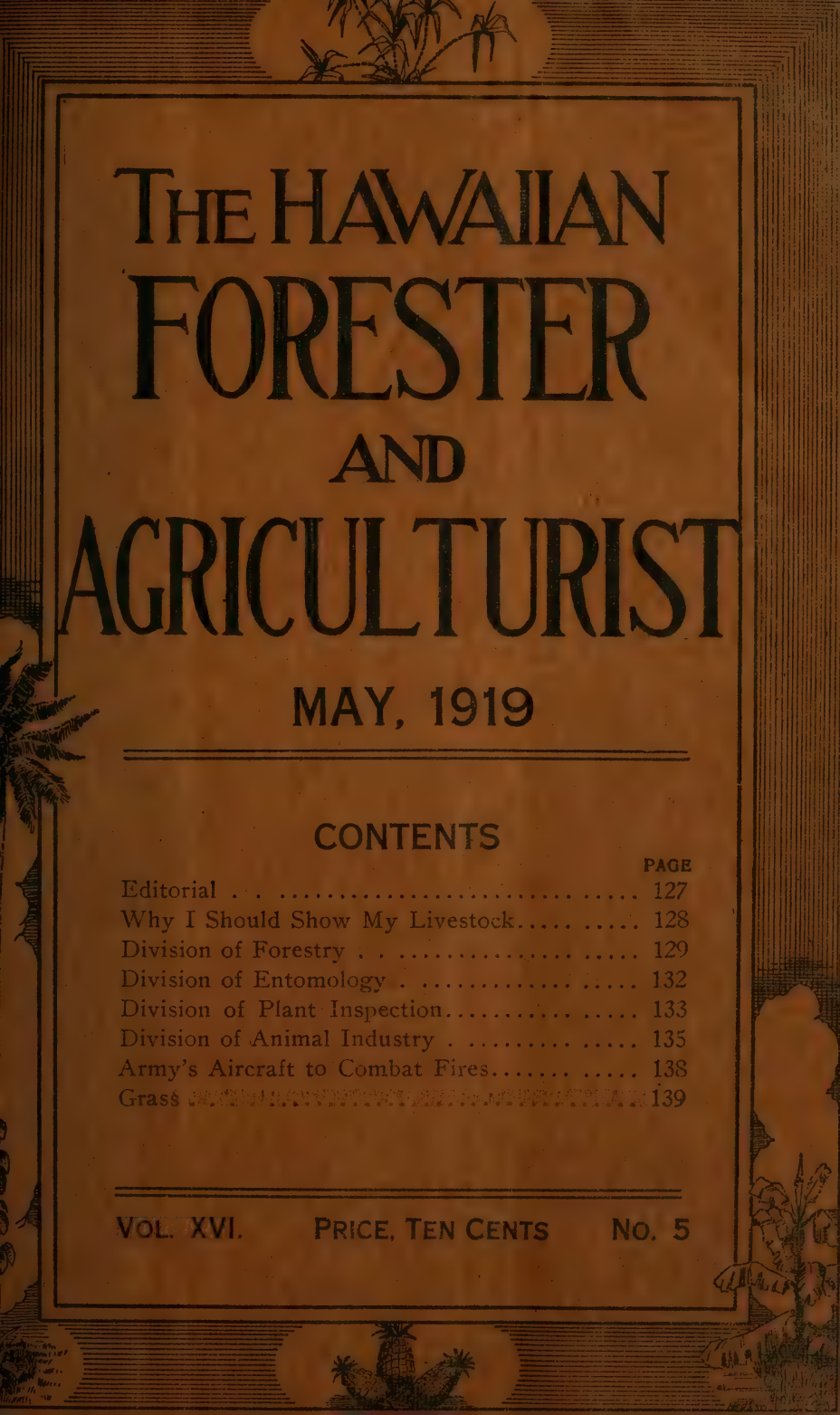
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

MAY, 1919

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VOL. XVI.

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NO. 5



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A Monthly Magazine of Forestry,  
Entomology, Animal Industry  
and Agriculture.

Issued under the direction of the Board  
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**DANIEL LOGAN**

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# Board of Agriculture and Forestry

## DIVISION OF FORESTRY.

### FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

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A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, MAY, 1919.

No. 5

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The occurrence already of two grass and forest fires on Hawaii should be a reminder to everyone that during the dry season which is upon us every precaution should be taken against the starting of uncontrolled fires.

Over half the trees planted on forest reserves by the Division of Forestry in April consisted of the native koa.

Chief Plant Inspector E. M. Ehrhorn left for California on April 22 on a combined vacation and official trip. He will be back about the middle of June.

The several divisions of the Board are planning to exhibit at the coming Second Territorial Fair to be held in June.

Prior to his leaving for Australia a new commission was, on May 5, issued by the Board to Mr. Frederick Muir as "Field Entomologist for the Collection of Beneficial Insects."

Two new botanical bulletins by Prof. J. F. Rock will soon be ready for distribution. One deals with the native leguminous trees of the islands and the other describes the native cotton trees, some of which are already extinct.

In Kansas this season cattle pastures were rented as high as \$20.00 a head for the season according to reports to the U. S. Department of Agriculture. Many contracts were made at from \$13.00 to \$18.00 per head and none below \$10.00.

Three loads of branded Montana Herefords, after being topped out in the corn belt recently, sold on the Chicago market for slaughter at \$20.35 per hundredweight. They averaged 1486 pounds and brought \$302.40 a head.

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# Why I Should Show My Livestock

By L. A. HENKE, Chairman Livestock Committee.

Livestock breeders on the mainland who have consistently shown their animals at the big livestock shows year after year do not ponder about the above question any more, for their experience has proved to them that it pays in actual dollars and cents.

President McKinley in his address at Buffalo a few hours before his assassination expressed as the central thought of his discourse, "Expositions are the big time keepers of progress." Nothing is so stimulating in the improvement of livestock as observing how your animals show up in competition with other animals of the same breed. And the poorer the showing that they make the greater are the probabilities that the following year will bring about a great improvement.

Many breeders who have become factors in the livestock world started their career by showing an animal which in their judgment seemed to possess unusual merit. Very likely the judge did not agree with them and gave their animal third or perhaps even lower place, carefully explaining why the animal was inferior. Certain type of men will say at once that the judge does not know what he is talking about, and hence they will learn nothing from his explanations because of their contrary attitude. But the breeders who are bound to succeed are the ones who recognize the fact that the judge may know more about stock than they do, and they use the criticisms of the judge as stepping stones to success, and sooner or later these men will be factors to contend with when the championship ribbons are distributed. To such men a livestock show becomes invaluable for they gain experience in a few days which they could not gain in any other way, and this experience more than compensates for the cost and labor of exhibiting.

The Fair Commissioners have spared no expense or trouble in securing the best livestock judges on the Pacific Coast for the coming Fair. Professor True of the University of California was here last year and his good work will be remembered by all livestock men and needs no further comment. Mr. True will be ably assisted this year by Professor McLean of the University of British Columbia. Professor McLean's work in the judging ring has given him a very enviable reputation. With these two men assured for judges, livestock exhibitors are sure of having their animals placed by men absolutely competent to do so, and whatever criticisms that these men may make of an animal will be of great value to the owner if he takes the criticism in the same manner that it will be given.

A prominent breeder went away from the Fair last year say-

ing: "I thought I had some good stock, but I will have to hand it to ———. He beat me this year, but I have learned a few things and I am going to show better stock next year, and . . . . . had better look to his laurels a few years from now." This friendly competitive attitude is the attitude that means better stock for the whole territory, and hence greater prosperity for everyone.

To these men who have animals to sell and expect to continue selling animals, the advertising gained at a Fair is a benefit quite distinct and aside from the educational value to the exhibitor.

J. Ogden Armour says: "It costs no more to raise a 1200 lb. steer than a 600 lb. scrub." Let us bring our animals to the Fair and if there are any 1200 lb. steers there that are better than the ones we bring let us find out why they are better.

## Division of Forestry

Honolulu, Hawaii, April 30, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of April, 1919:

### TREE PLANTING.

During the month 548 koa trees were planted in Makiki Valley on the Honolulu Watershed and 1283 koa trees and 1430 yellow poinciana trees at Mikilua in the Lualua'ei Forest Reserve, Oahu, making a total of 3261 trees. The koa trees planted at Mikilua, near Kolekole Pass, in August and September, 1918, are doing well and some are already three feet high.

Our supply of koa trees is about exhausted because of the lack of seed. There is some promise that the present crop may yield us a quantity of seed and every effort will be made to secure a supply before it is destroyed on the tree by the moth borer, *Cryptophlebia illepidia*.

### FOREST NURSERSIES.

Forest Nurseryman David Haughs spent from April 7 to 10 at Haiku, Maui, conferring with Forest Ranger James Lindsay and making arrangements with him for the early establishment at Haiku of a nursery for raising forest, ornamental and shade trees for distribution on Maui in order to comply with the new plant quarantine regulations soon to go into effect.

On April 3, Mr. W. D. McBryde, agent in charge of the sub-nursery at Kalaheo, Kauai, resigned on account of the pressure of private business. Mr. McBryde has performed valuable work for this Board gratis in the past and it is with regret that he could not be persuaded to continue. Since the present demand for trees is mainly on the windward side of the island, it is planned to establish a new nursery on some government land at Kapaa.

### FOREST PROTECTION.

Owners of several head of half-wild cattle, which were still at large in the Hauula Forest Reserve, Oahu, were notified to remove them

at once, and this was accomplished with the exception of one head which if not removed soon will have to be shot.

#### PUU KA PELE PARK.

On April 2, the hearing was held to consider the withdrawal of the 415 acres from the Puu Ka Pele Forest Reserve, Kauai, for park purposes. No one appearing to raise objections, the Governor on the same day signed the proclamation of withdrawal which was published on April 3. The matter has since been in the hands of the Commissioner of Public Lands.

#### FOREST FIRES.

The following two forest fires on Hawaii were reported during the month:

February 27, 1919.—Ohaieka section of Kapapala Ranch, Kau, Hawaii. A fire broke out at 1 o'clock, probably on account of the carelessness of some unknown smoker, and spread over 1500 acres of mostly grass land. On the area there were numerous clumps of koa trees but fortunately few of these suffered damage. The manager of the ranch with his cowboys, assisted by 25 men from Pahala plantation under Fire Warden James Campsie, succeeded in controlling and extinguishing the fire.

February 29, 1919.—Wailau, east of Hilea and west of Pahala, at the edge of the Kau Forest Reserve, Hawaii. The fire, of which the origin is unknown, burned over about 40 acres of forest land with considerable damage to undergrowth and a quantity of ohia trees. Men under Fire Warden James Gibb, assisted by 60 men under Warden Campsie, soon extinguished it.

#### HAWAII TRIP.

From April 19 until the end of the month, at the request of Governor McCarthy, I accompanied the Director of National Parks, Stephen T. Mather, and his party on an inspection of the Kilauea and Haleakala sections of the new Hawaii National Park.

An opportunity was afforded at the Volcano House to confer with Ranger Mackenzie on the forest work in his district.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

#### REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, April 30, 1919.

Superintendent of Forestry,  
Honolulu, T. H.

Dear Sir:—The following is a report of the principal work done during the month of April:

#### NURSERY.

##### *Distribution of Plants.*

	In Seed Boxes.	In Transplant Boxes.	Pot Grown.	Total.
Gratis . . . . .	12,500	1,850	619	14,969
Sold . . . . .	1,000	100	34	1,134
Including Forest Reserves, etc.	13,500	1,950	653	16,103

## COLLECTIONS.

Collections on account of plant sold.....	\$ 4.40
Rent of Office Building Grounds, for February.....	35.00
Total . . . . .	\$39.40

## MAKIKI STATION.

The work done at this station has been principally routine. We have now got a good stock of trees on hand and shall be able to fill all orders, with the exception of the very large ones which require notice to be given in advance.

## HONOLULU WATERSHED PLANTING.

At the top of Opu Valley 548 koa trees were planted. Other work done consisted in making holes and clearing off.

## TREE PLANTING AT SCHOFIELD BARRACKS.

The beautifying of the Post by the setting out of trees and other plants is a very creditable piece of work and will in years to come, there is no doubt, reflect back on the foresightedness and good judgment of the present commander, General Heard. Captain Atkinson is superintending the work and the great interest he is taking in the laying out and beautifying of the post shows that he is heart and soul in the work. Since the beginning of the year we have delivered to Schofield Barracks over 20,000 trees and numerous other cuttings and plants. The new nursery started at the post a few months ago is getting stocked with vines and shrubs of all kinds, also a large assortment of annuals and cut flowers. The tree nursery at another part of the post has thousands of trees of different kinds transplanted into tin cans awaiting the time for planting out. The splendid example shown by General Heard and Captain Atkinson we hope will be the means of stimulating the interest in tree planting not only by the commanders of the other posts but by homesteaders and others who may have waste land not otherwise in cultivation.

## ADVICE AND ASSISTANCE.

The writer paid a visit to Haiku, Maui, for the purpose of making arrangements about the starting of a nursery to supply the islands of Maui with trees. The nursery at Haiku will be started at once. We are supplying seed and otherwise assisting in getting the nursery started.

The writer also spent a day with Captain Atkinson looking over the work at Schofield Barracks.

Visits made . . . . .	8
Advice by telephone . . . . .	6
Advice given people calling at Nursery.....	10

The writer spent four days in assisting in the judging of school and home gardens in connection with the Star-Bulletin contest.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.



# Division of Entomology

Honolulu, Hawaii, April 30, 1919.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

Gentlemen:—During the month of April the insectary handled 7500 pupae of the melon fly, from which were bred 495 females and 300 males, *Opius fletcheri*.

The distribution of parasites was as follows:

## MELON FLY.

### *Opius fletcheri*.

OAHU:	Females.	Males.
Fort Kamehameha . . . . .	100	100
Nuuanu . . . . .	40	30
Wahiawa . . . . .	20	20
Kailua . . . . .	270	240
HAWAII:		
Kamuela . . . . .	150	150

## FRUIT FLY PARASITES.

### *Opius humilis*.

OAHU:		
Nuuanu . . . . .	75	75
Makiki . . . . .	25	25
Kalihi . . . . .	25	25
HAWAII:		
Kamuela . . . . .	145	130
Hawi . . . . .	170	150

### *Diachasma tryoni*.

OAHU:		
Nuuanu . . . . .	75	75
Makiki . . . . .	25	...
Kalihi . . . . .	25	25
HAWAII:		
Kamuela . . . . .	45	25

### *Diachasma fullawayi*.

OAHU:		
Nuuanu . . . . .	85	75

### *Tetrastichus giffardianus*.

OAHU:		
Nuuanu . . . . .	700	
Makiki . . . . .	200	
Kalihi . . . . .	300	
HAWAII:		
Kamuela . . . . .	550	

### *Dirhinus giffardi*.

OAHU:		
Nuuanu . . . . .	230	

*Galesus silvestri.*

OAHU:	
Nuuanu . . . . .	400

## DUNG FLY PARASITE.

*Spalangia cameroni.*

OAHU:	
Wahiawa . . . . .	950

## CORN LEAF HOPPER PARASITE.

*Paranagrus osborni.*

OAHU:	
Schofield Barracks . . . . .	7,500
Makiki Nursery . . . . .	3,500
HAWAII:	
Hawi . . . . .	2,400
Kamuela . . . . .	3,800
KAUAI:	
Kealia . . . . .	5,300

During the month the Entomologist has given assistance to both the army and navy in suppressing the Japanese beetle—to the army at the nursery for tree planting at Schofield Barracks, to the navy at Pearl Harbor Naval Station.

The Entomologist has also acted as Plant Inspector in the absence of Mr. Ehrhorn and has spent several days on the waterfront when steamers from the Orient were in port.

Respectfully submitted,

D. T. FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, April 30, 1919.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

Gentlemen:—I herewith submit my report of the work performed by the Division of Plant Inspection for the month of April, 1919:

During the month 61 vessels arrived at the port of Honolulu, 22 of which carried vegetable matter subject to inspection, and one arrived via the Panama Canal. The following disposal was made of the various shipments:

	Lots.	Parcels.
Passed as free from pests . . . . .	559	10,707
Fumigated . . . . .	13	3,465
Burned . . . . .	38	58
Total inspected . . . . .	610	14,230

Of these shipments 13,946 packages arrived as freight, 212 packages as mail and 72 packages as baggage.

## RICE AND BEAN SHIPMENTS.

During the month 1945 bags of rice and 27 bags of beans arrived from the Orient and were found free from pests.

## PESTS INTERCEPTED.

Approximately 4382 pieces of baggage belonging to passengers and immigrants from foreign countries were examined, from which 24 lots of vegetables and 9 lots of fruit were taken and destroyed by burning.

On April 4, a package of sorghum cuttings in the mail from California was fumigated as a precaution and passed.

On April 9, two bags of coconuts from Fanning Island were fumigated before delivery.

On April 15, two shipments of orchids from Manila were fumigated. Two species of ants and a beetle larva were found in the packing.

On April 22, a small package of plumeria cuttings in the baggage of a Filipino immigrant from Manila were burned as a precautionary measure.

On April 23, two cases of Florida grape fruit were burned as they were badly infested with San Jose scale and showed evidence of fungus disease. On April 25 a third case of grape fruit was burned for the same reason.

Twenty-three packages of taro roots and tubers arrived at various times during the month in the mail, consigned to the Board of Agriculture and Forestry. There was much evidence of disease and all were burned.

On April 30, eight cases of fruit and ornamental trees from Japan were fumigated with hydrocyanic acid gas and all soil and packing removed and burned. Some fig trees were infested with a large Cerambycid borer, and a cocoon of a Cnidocampus moth was found on camellia. All infested trees were burned.

During the month of April, 1282 bags of corn, 77 bags of awa root and 16 bags of beans were fumigated for the accommodation of local merchants, a total of 1375 bags.

## HILO INSPECTION.

Brother M. Newell, Inspector at Hilo, reports the arrival of ten vessels at the port of Hilo, three of which carried vegetable matter, consisting of 107 lots and 1647 packages. With the exception of two colonies of ants found in plants from Philadelphia, all were passed as free from pests. The S. S. "Anyo Maru" arrived in Hilo on April 16, direct from Japan with 4916 bags of rice, 539 bags of beans and 4 cases of sesame seeds, all of which were found free from infestation.

## KAHULUI INSPECTION.

Mr. Will J. Cooper, Inspector at Maui, reports the arrival of five vessels at the Port of Kahului, one of which carried vegetable matter, consisting of 37 lots and 489 packages. All shipments were found free from pests.

## INTER-ISLAND INSPECTION.

Sixty-one steamers plying between Honolulu and other island ports were attended and the following shipments passed as free from pests:

Taro.....	542 bags
Vegetables.....	231 packages
Plants.....	123 "
Fruit.....	28 "
Sugar cane (seed).....	14 cases
Total passed.....	938

Four packages of plants and five packages of fruit were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

D. T. FULLAWAY,  
Acting Chief Plant Inspector.

## Division of Animal Industry

Honolulu, Hawaii, May 16, 1919.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, T. H.

Gentlemen:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of April, 1919:

### LEGISLATION AND THE DIVISION OF ANIMAL INDUSTRY.

The most important bill passed by the last legislature in so far as this Division is concerned was the new tuberculosis indemnification act, which was signed by the Governor on April 30. This act differs from the old one in various important ways, but principally in that it places no limit upon the appraisal and makes it possible for the owner of high class, purebred cattle to collect full value for reacting animals which upon post mortem examination cannot be proved to be affected with tuberculosis. Such cases are rare (two out of nearly five hundred during the last two years), but if a few should occur when the best imported breeding stock is being tested, the entire appropriation of \$20,000 would soon be exhausted. The new bill raises the limit of indemnification for cattle proved on post mortem to be tuberculosis to \$350 for purebreds and \$250 for grades, as compared to respectively \$250 and \$150 before.

The manner of appraisal has been simplified in that it allows the officer making the test, whenever possible, to come to an understanding with the owner in regard to the value of the condemned animals. This will in most cases obviate the necessity of having a special appraiser visit all premises where reactors are found. If an agreement cannot be reached, a board of appraisers has been provided for.

The new bill also provides for the testing of beef cattle when there is reason to suspect the presence of tuberculosis, whereas previously dairy cattle only could be tested. Unfortunately a proviso limiting the number of times a herd can be tested to once every six months found its way into the bill while in committee. Only when a herd contains more than fifteen percent of reactors can more frequent tests be applied. It is, however, safe to say that there is no herd left with that amount of infection, at least not on this island.

Taken altogether the act is serviceable though it undoubtedly will



be more difficult of administration than the old act. The greatly increased amounts of indemnification will tend to provoke extravagant claims and appraisal will no doubt frequently have to be left with a board of appraisers, as no limit whatever is provided by the act. The funds provided (\$20,000), together with the residue from the previous act (about \$3,500), and the partial indemnification promised by the Federal Department of Agriculture (\$25 to \$50 per head of condemned cattle) should, however, be ample to practically suppress bovine tuberculosis in the course of the next two years.

#### ANIMAL INDUSTRY REVOLVING FUND.

Act 85 (Senate Bill No. 147), approved by the Governor on April 15, is another bill originating in this Division. It provides a revolving fund of \$5000 for the purchase of preventive and curative serum, vaccine, bacteria and other remedies for the control of livestock diseases, thereby insuring that the remedies are at hand should such diseases appear suddenly. Prior to the passage of this act, it had been necessary to send to the mainland for this class of remedies, which cannot be carried in stock here commercially. The delay thereby incurred has at times proved costly, as was the case with the anthrax outbreak in 1917, when eleven days elapsed before the arrival of the vaccine, which had been cabled for, and during which period more than one hundred animals were lost.

The new act authorizes this Board to sell the supplies thus purchased to the owners of diseased livestock at actual cost, to be administered by the veterinary officers of this Division, and to collect the cost and deposit it with the Treasurer of the Territory to the credit of the animal industry revolving fund. The act is therefore a definite departure from the paternal policy of supplying such remedies free of cost, as adopted by the 1917 legislature as a war measure.

Under this act, which becomes effective upon its approval by the Governor, there were purchased during the month 3000 doses of anthrax simultaneous treatment at a cost of 22.8 cents per dose (\$684). This is 7.2 cents less per dose than any previous price. The vaccine was sent to Dr. Golding at Hanalei, Kauai, who reports having used about 1500 doses during the month.

It is the aim of this Division, under the provisions of the revolving fund act, not alone to keep on hand a stock of remedies most frequently needed here, such as mixed bacterins for swine plague, necrotic enteritis, chicken cholera, strangles, hemorrhagic septicemia of cattle and sheep, as well as various kinds of serum, but also to test out a number of the many new remedies that are now being recommended for internal and external parasites. That intestinal worms are becoming more prevalent than hitherto, and especially in hogs, poultry and dogs, is unquestioned, while lice, ticks and mites are found in practically every chicken yard and dog kennel. These parasites should be reduced by the universal use of some cheap but effective remedies and the opportunity is at hand to ascertain what to recommend.

#### REIMBURSEMENT FOR ANTHRAX LOSSES.

A number of bills were passed by the last legislature reimbursing various parties for losses suffered as a result of quarantine measures against anthrax. The bills carried appropriations aggregating more than \$10,000. This brings the total cost of suppressing the 1917 anthrax outbreak to well above \$45,000. An equal amount, approximately, was lost in live stock which died from the disease. It is therefore satisfactory to be able to report that the suppressive and protective measures adopted appear to have been very effective. On neither Oahu nor Maui has a single case of anthrax occurred since the fall of 1917.

On Kauai only two cases occurred during 1918 and one case this spring, which is a remarkably low record considering the very heavy infection and great mortality which characterized the outbreak.

#### DOG INSPECTION AND QUARANTINE.

Not less than 18 dogs arrived during the past month. Of these 15 were soldiers' mascots, belonging to the Seventeenth Cavalry. Two were ships' dogs which were allowed to remain on board. The last dog was being carried ashore from the U. S. transport Sherman when discovered by Mr. Langford of the entomological force, who, examining the basket for fruit, found the fruit and the dog. The quartermaster disclaimed any knowledge of the dog being on board though admitting that it was against orders. The dog was taken to the quarantine station.

A total of 37 steamers and sailing vessels were visited, and copies of Rule VIII of this Division were in all cases left with the master or officer in charge.

From Hawaii, Dr. Elliot reports an outbreak of cerebro spinal meningitis in the Hawi Mill stables with several deaths.

From Maui, Dr. Fitzgerald reports the suppression of the hog epidemic at the Robinson Ranch, and the tuberculin testing of one thousand cattle.

From Kauai, Dr. Golding reports the revaccination of 1500 head of cattle on the Princeville Plantation.

Very respectfully,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

---

### REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, April 30, 1919.

Dr. V. A. Norgaard, Chief, Division of Animal Industry, Bureau of Agriculture and Forestry, Honolulu.

Sir:—I beg to submit the following routine report for the month of April:

#### TUBERCULOSIS CONTROL.

The work in this line was confined to post mortem examinations made on cattle previously condemned. Lesions of tuberculosis were found in each examination made.

#### CONTAGIOUS EPITHELIONIA.

A few small outbreaks of this disease occurred during the past month. About 1000 c.c. of chicken pox and turkey pox vaccine were made up in the laboratory and distributed throughout the island.

#### IMPORTATION OF LIVESTOCK.

Inspections were made at 37 steamers during the month of which the following were found to carry livestock:

S. S. Wakau, San Francisco: 2 Berkshire hogs, Kamehameha Schools.

S. S. Sachem, San Francisco: 2 horses, Joe Denny; 3 horses, C. H. Judd; 5 horses, U. S. Q. M. Department; 16 crates poultry.

S. S. Torri Maru: 2 cats and 2 dogs, not landed.

U. S. T. Sherman, San Francisco: 1 dog, Mrs. C. R. Stark.

S. S. Manoa, San Francisco: 12 crates (15 dogs), J. Rothschild & Co.; 1 monkey, 17th Cavalry.

S. S. Coconino, San Francisco: 2 crates chickens, American Railway Express Co.

S. S. Hyades, San Francisco: 6 crates chicks, J. C. Rued; 1 crate turtles, Hong On.

S. S. Niagara, Sydney: 2 Australian bears, Bruce Heatheote.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

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## ARMY'S AIRCRAFT TO COMBAT FIRES.

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Army airplanes and captive balloons will cover portions of the national forests of California, Arizona, New Mexico, and other States this summer, to aid in detecting and suppressing forest fires. In compliance with an order from Secretary Baker directing the Air Service to cooperate with the Forest Service of the United States Department of Agriculture in this work, conferences are under way to determine where and to what extent the air scouts will supplement the forest rangers.

That there is a distinct and important place for aircraft in fire protection of timberlands is regarded by the Forestry officials as beyond doubt, but experimental trial of methods and possibilities will have to be the first step. This is now being planned for the coming fire season. Army airdromes and bases will be utilized for the experiments. Some of the bases near enough to national forests to be used advantageously are the flying fields at San Diego, Riverside, and Arcadia in southern California. Other points in the West and in the East are under consideration, including one near the White Mountains in New Hampshire.

One of the interesting possibilities to be tested is bombing fires to put them out. It is believed that bombs charged with suitable chemicals can be used with good results. Another plan to be tested is transporting fire fighters by dirigibles from which ladders can be lowered to the ground.

The chief use of the aircraft this summer, however, will be for fire detection. At present the Forest Service relies for this partly on patrol, usually by men on horses, motorcycles, or railroad speeders, and partly on watchers stationed at lookout points. Aircraft have many points of obvious superiority for both classes of detection work.

Lookouts in a very broken country, cut up by deep canyons or where mountain ridges obstruct the view, or in a flat country that affords no good points of vantage, are often unable to pick up all fires quickly by the rising smoke, or to locate them accurately. For precise location the system in use depends on triangulation through reports telephoned from separate observation



points. Airplanes would use wireless in reporting fires, as they have done in communicating with the artillery, and would locate fires by coordinates in the same way that gunfire in war is directed to a particular spot or object.

From the Army standpoint, the use of aircraft in protecting the national forests affords a valuable opportunity for training fliers and developing further the possibilities of aircraft and the art of flying.

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### GRASS.

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"Grass is the forgiveness of nature—her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grow green again with grass, and carnage is forgotten. Streets abandoned by traffic become grass-grown like rural lanes, and are obliterated; forests decay, harvests perish, flowers vanish, but grass is immortal. Beleaguered by the sullen hosts of winter, it withdraws into the impregnable fortress of its subterranean vitality and emerges upon the solicitation of spring. Sown by the winds, by wandering birds, propagated by the subtle horticulture of the elements, which are its ministers and servants, it softens the rude outline of the world. Its tenacious fibers hold the earth in its place and prevent its soluble components from washing into the sea. It invades the solitude of deserts, climbs the inaccessible slopes and forbidding pinnacles of mountains, modifies climates, and determines the history, character, and destiny of nations. Unobtrusive and patient, it has immortal vigor and aggression. Banished from the thoroughfares or the field, it hides its time to return, and when vigilance is relaxed or the dynasty has perished it silently resumes its throne, from which it has been expelled, but which it never abdicates. It bears no blazonry of bloom to charm the senses with fragrance or splendor, but its homely hue is more enchanting than the lily or the rose. It yields no fruit in earth or air, and yet should its harvest fail for a single year famine would depopulate the world."—John J. Ingalls, late Senator of Kansas.



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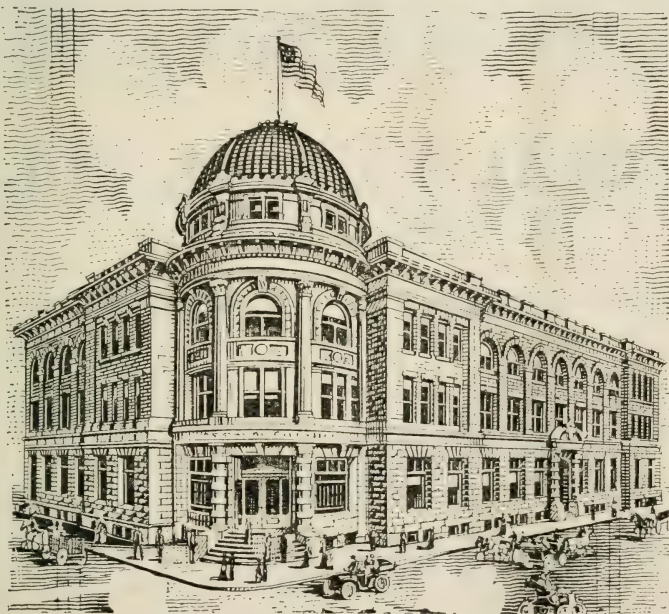
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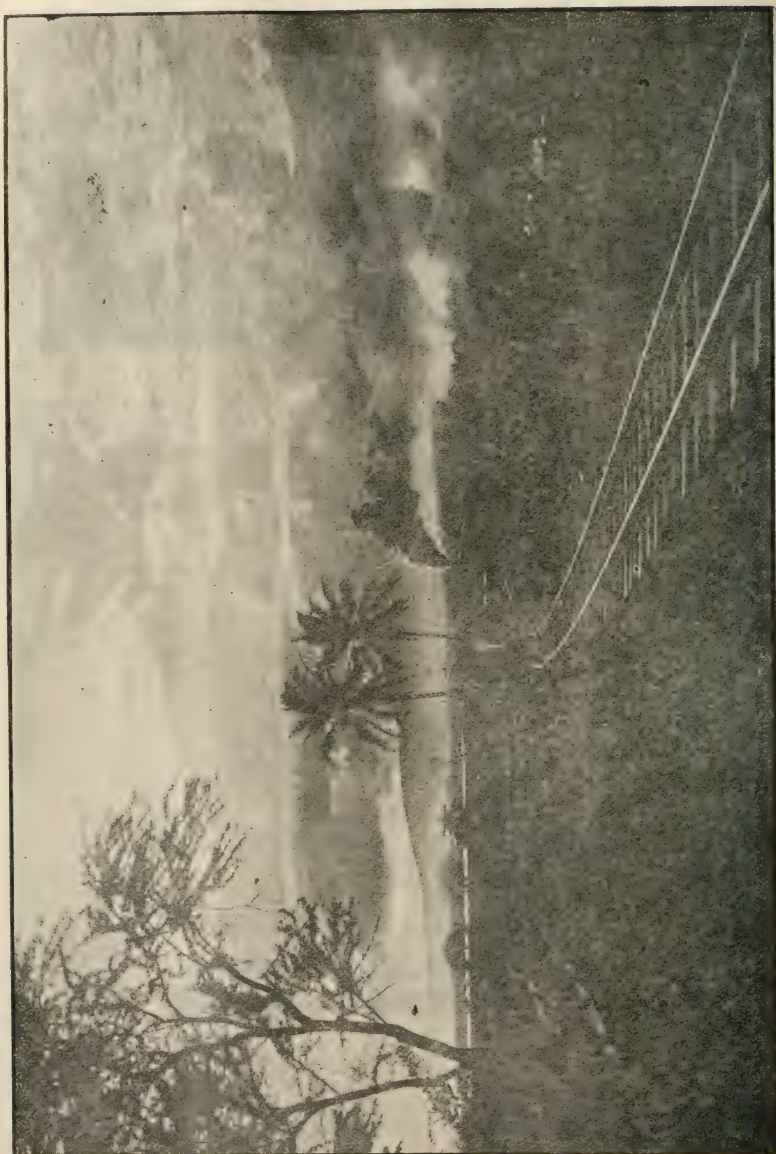
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

JUNE, 1919

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All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

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D. T. FULLAWAY,  
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, JUNE, 1919.

NO. 6

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Chief Plant Inspector E. M. Ehrhorn returned on June 17 from his trip to California.

The testing of dairy animals for bovine tuberculosis has been resumed under Revised Act 204 of the Session Laws of 1919.

The long-standing problem of ridding the Kula Forest Reserve on Maui of wild cattle seems at last near solution.

Tree planting on the forest reserves has been continued in favorable places where weather conditions permit, as will be seen by the report of the Superintendent of Forestry.

The Governor on May 26 approved Rule XX, Division of Plant Inspection, which rescinds the old Rule XVII and gives greater protection against the dissemination of insect pests and plant diseases in inter-island shipments.

The lectures to be given on forestry at the Territorial Summer School to be held at Kilauea, Hawaii, July 11 to August 22, will aim to inform the teachers of the need for the practice of forestry in Hawaii and how it must be accomplished.

The summer camps at Kokee, Kauai, are becoming quite popular. Already 23 applicants have paid their first year's fee and taken out ten-year permits for selected camp sites and many others are planning to establish transient camps during the coming summer.

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## New Botanical Bulletins.

The Division of Forestry has just issued two new bulletins which have been prepared by Consulting Botanist J. F. Rock.

Botanical Bulletin No. 5, "The Arborescent Indigenous Legumes of Hawaii," of 53 pages with 18 illustrations, treats of the four native genera of trees belonging to the bean family which include the two koas with the two varieties, the koaia, the uhiuhi,

which is rather rare, the mamani and its two varieties, and the wiliwili. The discussions of the origin of these trees in Hawaii are most interesting as well as the varietal aspects which they have assumed here.

Botanical Bulletin No. 6, "The Hawaiian Genus *Kokia*," of 22 pages with 8 illustrations, treats of the Hawaiian trees which are relatives of the well-known cotton plant and some of which have already become extinct. The bulletin describes for the first time a new variety of the *kokia*, recently rediscovered on Kauai, and bespeaks the preservation of this interesting genus by propagation and planting.

Copies of these bulletins may be obtained upon application to the Librarian of the Board, P. O. Box 207, Honolulu.

## New Plant Inspection Rule.

A new rule and regulation, Rule XX, adopted on May 22, by the Board of Commissioners of Agriculture and Forestry governing the shipment of plants, fruit, etc., between the islands was approved by Governor McCarthy on May 26, and went into effect on June 1, 1919.

The purpose of this rule is to safeguard more effectively the agricultural, horticultural and forest interests of the Territory, and it aims particularly to prevent the transmission of injurious insects in soil around plants or otherwise. Honolulu, being the port of entry for foreign plants, is more open to infestation by noxious insects and plant diseases than any other port in the Territory and for this reason closer restrictions have been placed on the shipment of plants in soil from Oahu to the other islands.

This new measure is in line with recent new restrictions placed by the Federal Horticultural Board of the U. S. Department of Agriculture on soils, plants, seeds, etc., entering the United States from foreign countries in order to prevent the introduction of any new insect pests or plant diseases.

The enforcement of this new rule will be in the hands of the Division of Plant Inspection which has its offices on Kekuanaoa street near the waterfront in Honolulu. The rule rescinds a former rule, Rule XVII, which was originally adopted in the days of the campaign against the Mediterranean fruit fly but many of the provisions of which are inapplicable at the present time.

The Board of Agriculture and Forestry, believing it necessary for the best interests of the Territory and particularly of the other islands that soil around plants should not be sent out of Honolulu, has given up the general distribution of plants in soil from Oahu to the other islands and is making arrangements at some inconvenience and expense so that plants for any particular island will be raised on that island. The nursery at Hilo in charge of Brother Matthias Newell has recently been enlarged



and will fill all orders for young trees for the island of Hawaii. A new nursery is being started at Haiku, in charge of Forest Ranger James Lindsay, to supply trees for Maui, and probably at Kapaa a new nursery will soon be established to take care of Kauai's demand for trees. The Government Nursery in Honolulu will continue to supply the demand for trees on Oahu but for Oahu only when shipped in soil.

Provision is made in the rule for exceptional cases when it is necessary to send a limited number of valuable or rare plants in soil but only by a special permit and under very restrictive conditions as to sterilized soil and plant quarantine.

Rule XX is published in the By Authority pages of this issue.

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## Book Review.

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Students of natural history, together with all who are interested in annals of Hawaii's earlier civilization, are debtors to Mr. W. F. Wilson of Honolulu for a book of 84 pages just published, entitled, "David Douglas, Botanist, at Hawaii." The work has been placed on sale at Thrum's.

It is an attempt, the compiler explains in a prefatory note, to bring together, under one cover, some interesting particulars that have already been published in different works—for the most part now out of print—regarding the life of David Douglas, the intrepid Scottish botanical explorer and mountain climber, and particularly that portion thereof which treats of his two visits to the Hawaiian Islands. A few explanatory notes and illustrations, it is mentioned, have been added by the compiler.

Extracts from a brief memoir of the life of Douglas by Sir William Jackson Hooker, professor of botany in Glasgow University, form the groundwork of the compilation, but facts gained by Mr. Wilson through his own researches, including corrections of errors made by different authors, which are interweaved in the eclectic subject matter or appear in footnotes, add greatly to the value of the production.

Including two portraits of Douglas and a picture of the tablet of his memory set in the wall of Kawaiahao church, Honolulu, the book is embellished with thirteen illustrations and six decorative tailpieces related to the contents. A bibliography appended contains twenty-three titles of publications referring to Douglas.

Unfortunately, on account of his untimely death on the island of Hawaii, where on July 12, 1834, he was killed by a bullock in a wild cattle trap pit into which he had fallen, David Douglas left few literary remains pertaining to his botanical explorations here, the extent of which though doubtlessly great can only be surmised. His investigations in other fields, of which the Northwest of America was an important one, he copiously journalized besides contributing accounts of them to various periodicals conducted by British scientific societies.

Probably the last letter that he ever wrote to any of his friends in Europe is one reprinted by Mr. Wilson, which was sent to Dr. Hooker from Honolulu under date of May 6, 1834. In the book is a list of several plants in the flora of Hawaii named for Douglas by some of his botanical friends. One variety of the silver sword fern was originally among the number but was afterward changed from *Argyrophyton Douglasii* to *Argyroziphium Sandwicens*.

As readers of the *FORESTER* will remember, the Douglas fir of the Northwest keeps green the memory of the distinguished Scottish botanist whose mangled body was buried in Kawaiahao churchyard, Honolulu, eighty-five years ago. The memorial tablet upon that edifice was sent from England by a contemporary scientist. It was intended for a tombstone but when it



reached here the location of the grave could not be identified. A monument to Douglas's memory was erected in the churchyard at New Scone, Scotland, near his birthplace, "by subscriptions among the botanists of Europe," as the inscription upon it states.

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## The Fire Danger.

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To be forewarned is to be forearmed. The danger of forest and grass fires during the dry season which is upon us has been called to the attention of the District Fire Wardens throughout the Territory by the following circular letter:

Board of Commissioners of Agriculture and Forestry, June 5, 1919.  
To the District Fire Wardens of the Board of Agriculture and  
Forestry Throughout the Territory.

GENTLEMEN:—A dry season is apparently before us and it is imperative that we do all we can to prevent the starting of uncontrolled grass fires and all brush and forest fires. A little time spent in preventing the starting of a fire will save an immense amount of time, labor and money in extinguishing one.

To bring the fire menace before the eyes of the public, the Chief Fire Warden has on hand a supply of cloth fire warnings which when posted in conspicuous places in the region of a fire menace serve to make the people more careful in the handling of fire. If there are any conspicuous places in your district where such signs could be used to advantage and you can arrange to have them posted, I shall be very glad to send you a supply upon receiving notice as to the number needed.

If any fires do, unfortunately, occur in your district will you kindly report them to me promptly, as required by law, using the following outline for your report:

Date fire started, date extinguished. Name of land and district. How fire started. Was originator of fire apprehended and prosecuted? Acreage burned over. Character of land (grass, brush, forest). Damage done by fire. Number of men used in extinguishing it.

The Territorial fire laws are set forth in Secs. 492 to 497 of the Revised Laws of Hawaii of 1915. A copy of these sections is enclosed herewith for your information.

Everything that you can do to prevent, control and extinguish uncontrolled grass fires and all brush and forest fires in your district will be most heartily appreciated.

Very truly yours,

C. S. JUDD,  
Chief Fire Warden.

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## Division of Forestry

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Honolulu, Hawaii, June 12, 1919.  
Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I respectfully submit the following routine report of the Division of Forestry for the month of May, 1919:

### TREE PLANTING.

During the month 2761 trees were planted out on forest reserves as follows: 589 koa on the Honolulu Watershed Reserve in Makiki, 122 silk

oak trees on the Kealia Reserve, Kauai, and 2050 yellow poinciana on the Lualualei Reserve, Oahu, in Mikilua. It has been rather dry at the latter place lately and only this species, which has stood planting well with the scanty moisture, is being used until there is more rain.

In response to a request sent to the American Consul at Taihoku, Formosa, on February 6, a supply of seed of *Acacia confusa*, a tree described in my February report, was received on May 16. Small lots of this seed will be distributed on application to those who wish to try out this tree which has been found most useful in Formosa.

Complying with a request from the president of the Punahou school for ideas concerning a planting scheme for the school campus, I submitted on May 16 recommendations and a list of trees for such planting, favoring almost exclusively Hawaiian species of trees and shrubs.

On May 22, a supply of trees was sent over to Waiahole, Oahu, for the first planting on the forest reserve in that region. These consisted of 260 molave, *Viter parviflora*, a useful tree of the Philippines which has already done well on the Manoa Ranger Station and which it is believed will be suitable for planting at Waiahole; 15 mahogany and 19 tulipwood, *Harpullia pendula*. Material has been sent over for a 10 x 10 foot nursery and potting shed where the plants can be handled and cared for preliminary to planting.

#### NEW NURSERIES.

Material for the new nursery at Haiku, Maui, has been ordered and a lease made with Ranger Lindsay for the use of a quarter-acre of land and laborer's house at \$10 per month. It is hoped to have the nursery in good running order by July 1, so as to receive orders by then for trees desired on Maui.

Negotiations are being conducted for the use of a similar area for the Kauai nursery on a part of the Mahelona Memorial Hospital grounds at Kapāa and it is hoped that it will be possible to start the nursery here at an early date.

#### FOREST FENCING.

Four new forest reserve fencing projects were started during the month, as follows:

*Kula Forest Reserve, Maui.* Total distance 4.45 miles. The Raymond Ranch has agreed to make stock-proof a distance of 2.65 miles of reserve boundary from the present fence near Puu Keokea running easterly to Kalepeamoa, and the Kaonoulu Ranch has agreed similarly to make impassable to stock the 1.8 miles of boundary between Keanoulu and Waiohuli within the reserve, the Division of Forestry furnishing the wire and staples and allowing the use of dead mamani trees on the reserve for posts. This will give complete protection to the area in the Kula Reserve which it is planned to plant up as soon as the cattle are removed and this removal of cattle can be accomplished and they can be kept out only by the construction of these fences. The problem of ridding this reserve of wild cattle, which has vexed us for so long, seems at last about to be solved.

*Sec. C. Olaa Forest Park Reserve, Hawaii.* Local residents have agreed to build two sections of fences, 1.14 and .45 miles in length, respectively, on forest reserve boundaries adjacent to their property in Olaa, the wire and staples being furnished by this Division, and Ranger Mackenzie will construct .19 mile of fence on a part of the boundary of the new Olaa Reserve where needed at 24 Miles to keep out wandering cattle.

A short stretch of fence which has hitherto enclosed a part of the land of Mr. L. L. McCandless at Puhawai, within the Lualualei Forest Reserve, is being moved back at the expense of the owner.

#### FOREST FIRES.

On May 6, a fire started at 2:30 p. m. from a brush fire which jumped

the fire lane, which had first been cleared as a precaution, and burned over about 40 acres of grass land on the north ridge of Kaleleiki Gulch in the Pupukea Reserve, Oahu. A few clumps of trees were damaged. Pineapple laborers from the homesteads and Libby, McNeill & Libby's plantation under Fire Warden F. S. Lyman succeeded in extinguishing it at 10 p. m. the same day.

## BOTANICAL BULLETINS.

During the month two new botanical bulletins by Consulting Botanist J. F. Rock, Bulletin No. 5, "The Aboreseent Indigenous Legumes of Hawaii," and Bulletin No. 6, "The Genus *Kokia* in Hawaii," were sent to the press and proof-read.

Mr. Rock left on May 10 for Java and India on a tree seed collecting expedition for the H. S. P. A. on which he has been instructed to collect seeds of certain trees desired for planting by this Division.

## KOEKE CAMPS.

Permits to occupy the following camps at Kokee in the Na Pali-Kona Forest Reserve, Kauai, have been given out since those given in the list in my February report were issued:

<i>Camp No.</i>	<i>Permittee</i>	<i>Acreage</i>	<i>Annual Rental</i>
2 .....	Mrs. Annie S. Knudsen.....	1.7	\$167.00
3 .....	Eric A. Knudsen.....	2.0	23.00
14 .....	Hans P. Faye .....	2.0	80.00
23 .....	Y. W. C. A. ....	0.3	3.00
24 .....	Augustus F. Knudsen .....	1.7	20.00
25 .....	Boys Camp, A. F. Knudsen, Trustee.....	1.1	11.00
31 .....	Chas. A. Rice .....	1.2	12.00
33 .....	Anna C. Wilcox .....	.7	7.00
34 .....	C. H. Wilcox .....	.8	8.00
45 .....	J. A. Hogg, Jr. ....	1.3	13.00
47 .....	E. F. Wood .....	.9	9.00

## FOREST PROTECTION.

On May 10, a permit was issued to the Kukaian Ranch to construct and maintain a telephone line across the lands of Laupahoehoe and Humuula in the Hilo Forest Reserve, Hawaii, on condition that the least possible damage in its construction be done the forest. This line will connect up the land of Maulua near Piha with ranch headquarters and will be a valuable as well as convenient adjunct in the work of forest protection in this region.

On May 29, 17 standard forest reserve pipe monuments were distributed at boundary points on the Pupukea Forest Reserve, Oahu, and water reserves in this region. These will soon be erected so as to mark definitely and permanently the reserve lands in this region.

## MISCELLANEOUS.

Preparations have begun for lectures on Elementary Forestry and the Forests of Hawaii to be delivered at the Territorial Summer School at Kilauea, Hawaii, in July or August.

At the request of the editor of "The Timberman" of Portland, Oregon, an illustrated article on the Hawaiian koa tree was prepared and sent to him for publication.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, June 16, 1919.

Superintendent of Forestry, Honolulu, T. H.

DEAR SIR:—I herewith submit a report of the principal work done during the month of May:

## NURSERY.

*Distribution of Plants.**Pot Grown.*

Sold.....	140	
Gratis.....	4,297	sent to Government forest reserves;
	2,741	sent to Schofield Barracks, homesteaders, schools, and—
	3,461	sent to other Government institutions.
Total.....	10,639	

## COLLECTIONS.

Collections on account plants sold .....	\$ 3.35
Rent of Office Building, Nursery Ground, February.....	35.00
Total.....	\$38.35

## MAKIKI STATION.

The work at this station has been principally routine, consisting of mixing and sterilizing soil, potting and transplanting trees, cutting up wood for boxes and fence posts, etc.

## HONOLULU WATERSHED PLANTING.

589 koa trees were planted at the top of Opu Valley. Other work done consisted of making holes and clearing.

## ADVICE AND ASSISTANCE.

The writer has been requested by the president and members of the Alewa Improvement Club to draw up a planting plan for the Alewa Heights district. A plan will be made and submitted to the club at its next meeting.

The writer has made the following number of calls and otherwise given advice and assistance at the request of people in and around the city:

Calls made .....	5
Advice by telephone .....	8
Advice to people calling .....	11

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.



# Division of Entomology

Honolulu, Hawaii, May 31, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—During the month the insectary handled 15,700 pupae of the melon fly, from which there were bred 1239 females and 1109 males *Opius fletcheri*. The distribution of parasites was as follows:

## MELON FLY PARASITE.

### *Opius fletcheri*.

	<i>Females.</i>	<i>Males.</i>
OAHU:		
Maunawai . . . . .	720	575
Fort Kamehameha . . . . .	20	20
Pearl Harbor . . . . .	50	50
Kaialua . . . . .	150	120
MAUI:		
Wailuku . . . . .	25	25
HAWAII:		
Kamuela . . . . .	25	20

## FRUIT FLY PARASITES.

### *Opius humilis*.

OAHU:		
Nuuanu . . . . .	25	25
MAUI:		
Wailuku . . . . .	20	20
HAWAII:		
Kohala . . . . .	20	30

### *Diachasma tryoni*.

OAHU:		
Nuuanu . . . . .	500	200
Kaimuki . . . . .	120	80
Pearl Harbor . . . . .	25	25
MAUI:		
Wailuku . . . . .	80	80
HAWAII:		
Kohala . . . . .	40	65
Kamuela . . . . .	25	25

### *Tetrastichus giffardianus*.

OAHU:	
Nuuanu . . . . .	1,200
Kaimuki . . . . .	100
Pearl Harbor . . . . .	400
MAUI:	
Wailuku . . . . .	300
HAWAII:	
Kohala . . . . .	200

### *Dirhinus giffardi*

OAHU:	
Nuuanu . . . . .	350

*Galesus silvestri.*

OAHU:	
Nuuanu . . . . .	1,400

## HORN FLY PARASITES.

## Philippine Pteromalid

*Pachycrepoideus dubius.*

MAUI:	
Pearl Harbor . . . . .	150

*Spalangia cameroni.*

OAHU:	
Maunawai . . . . .	3,000
Moanalua . . . . .	500
Wahiawa . . . . .	500

## CORN LEAF HOPPER.

*Paranagrus osborni.*

OAHU:	
Makiki Nursery . . . . .	11,700
Schofield Barracks . . . . .	4,500
MAUI:	
Kula . . . . .	2,000
HAWAII:	
Kamuela . . . . .	2,400
Laupahoehoe . . . . .	2,000
MOLOKAI:	
Pukoo . . . . .	7,000

Considerable time has been spent on inspection work on the waterfront and in the preparation of an exhibit for the Territorial Fair.

Respectfully submitted,

D. T. FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, May 31, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

GENTLEMEN:—I herewith submit my report of the work performed by the Division of Plant Inspection for the month of May, 1919.

During the month, 54 vessels arrived at the port of Honolulu, 21 of which carried vegetable matter subject to inspection; and 9 vessels arrived via the Panama Canal. The following disposal was made of the various shipments:

	<i>Lots.</i>	<i>Parcels.</i>
Passed as free from pests . . . . .	504	7,847
Fumigated . . . . .	22	2,366
Burned . . . . .	42	42
Returned . . . . .	6	6
Total Inspected . . . . .	574	10,261

Of these shipments 9962 packages arrived as freight, 218 packages as mail and 81 packages as baggage.

#### RICE AND BEAN SHIPMENTS.

During the month 28,640 bags of rice and 3873 bags of beans arrived from the Orient and were found free from pests.

#### PESTS INTERCEPTED.

Approximately 3736 pieces of baggage belonging to passengers and immigrants from foreign countries were examined, from which 23 lots of fruit and 3 lots of vegetables were taken and destroyed by burning.

On May 6, nine ornamental plants in baggage from Japan were fumigated and passed. Three lots of bamboo shoots were burned, being a prohibited importation.

On May 14, 2323 fruit and ornamental trees from Japan were fumigated and all soil and packing removed and burned. A caterpillar was found on leaves of cryptomaria and a single pupa in the soil. A dipterous maggot was found on the leaves of palms. Fourteen trees of the shipment infested with scale insects were burned. Small colonies of two species of ants, *Monomorium pharaonis* and *Prenolepis longicornis*, were found in the soil and packing.

On May 27, two orchids and 23 litchee trees in baggage from the Orient were fumigated and passed.

Following are the interceptions in the mail and disposal of same:

May 6, two packages tulip bulbs from Portugal, returned as unmailable.

May 7, one package carob beans from San Francisco, infested with *Bruchids*, fumigated.

May 7, one package napir grass from United States, infested with *Aphis*, fumigated.

May 12, two packages tree seed from Manila, fumigated as a precaution.

May 12, one package yams from Manila, infested with *Anthruid* beetles, burned.

May 12, one package pine cones from Manila, returned as unmailable.

May 12, one package tree seed from Formosa, fumigated as a precaution.

May 14, one package paeony roots from Japan, returned as unmailable.

May 14, one palm seed from South Africa, fumigated as a precaution.

May 27, one package dahlia bulbs from California, infested with mealy bugs, fumigated.

During the month 1872 bags of corn and 165 bags of peanuts were fumigated for the accommodation of local merchants—a total of 2037 bags.

#### HILO INSPECTION.

Brother Matthias Newell, Inspector at Hilo, reports the arrival of ten vessels at the port of Hilo, three of which carried vegetable matter, consisting of 107 lots and 1908 packages. All were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Will Cooper, Inspector at Maui, reports the arrival of four vessels at the port of Kahului, one of which carried vegetable matter, consisting of 251 lots and 273 packages, all of which were free from insect pests.

#### INTER-ISLAND INSPECTION.

Fifty-six steamers plying between Honolulu and other island ports were attended and the following shipments were passed as free from pests:

Taro.....	566	packages
Vegetables.....	209	"
Plants.....	149	"
Fruit.....	51	"
		<hr/>
		975 packages

Twelve cases of sugar cane seed were shipped by the H. S. P. A. Two lots of plants and seven lots of fruit were refused shipment on account of infestation or undesirable soil.

Respectfully submitted,

D. T. FULLAWAY,  
Acting Chief Plant Inspector.

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## Division of Animal Industry

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Honolulu, Hawaii, June 16, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

GENTLEMEN:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of February, 1919:

### THE ANTHRAX SITUATION ON KAUAI.

I regret to have to report that some rather unfortunate results have attended the annual vaccination of the Princeville Plantation livestock with anthrax vaccine. About 30 head, all horses, have developed more or less pronounced swellings on the side of the neck, that is, at the place where the attenuated virus had been injected. These swellings, in some cases, practically extended from the lower jaw along the under side of the neck to the chest and in three cases resulted in death. Most of the other swellings subsided in the course of a few days to a week, even though some of them became as large as coconuts. In no case has it been possible to demonstrate the anthrax bacillus in the swellings. The most remarkable fact, however, is that these swellings did not develop until 10 to 20 days after vaccination and it is therefore highly improbable that the vaccine is the cause of them; but why they should all appear on that side of the neck, where the attenuated virus had been injected, remains a mystery. Dr Golding is of the opinion that the three deaths resulted from hemorrhagic septicemia, which diagnosis is borne out by his post mortem notes and by the microscopic slides forwarded by him. The other swellings, however, which remained localized, are more likely due to malignant edema infection.

In order to look further into this matter, I have been authorized by the President of this Board to visit Kauai, for which place I shall leave on June 16.

For the further information of the Board, the correspondence between Dr. Golding and myself pertaining to this subject is herewith appended.

I have cabled for 500 doses of equine hemorrhagic septicemia vaccine as authorized by the Animal Industry Revolving Fund Act.

### BOVINE TUBERCULOSIS.

As reported by the Assistant Territorial Veterinarian, 437 head of cattle were tested during the past month. Of this number 33 reacted to the test and have either been destroyed or are to be butchered in the near future. Of the condemned animals, 10 belong to Charlie Bellina and 10 to a Japanese dairyman by the name of Nakamura. Of Bellina's reactors three were im-



ported cattle, but, as they have been tested before without reacting, compensation will have to be paid for them. As Nakamura's reactors constitute more than 15% of his herd, we shall test his dairy every three months until it is cleaned up.

While on Kauai, I shall start Dr. Golding testing the dairy herds of that island.

I apprised the federal Bureau of Animal Industry of the passage of the new bovine tuberculosis indemnification act and requested that the Territory be admitted to cooperate with the said bureau in order that we may benefit by the federal compensation act which, it is expected, will be passed by the U. S. Congress in the near future.

#### RABIES IN ENGLAND.

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For the information of the Board, there is appended a letter from Captain A. L. C. Atkinson of this Board enclosing a clipping from the "London Times," from which it would appear that rabies has gained a strong foothold in southern England and is rapidly spreading. In consequence, the Board of Agriculture and Fisheries have issued an order prescribing the muzzling of all dogs with wire cage muzzles over a wide area, including the whole of the counties of London and Middlesex and portions of the adjoining counties. Dogs may not be taken out of this area without a license from the board, and this license requires that dogs so moved shall go to approved veterinary premises where they will be detained for six months' quarantine. The board has ordered one thousand wire cage muzzles for free distribution.

With regard to the application of the dog owners of the 17th U. S. Cavalry, now stationed at Schofield Barracks, for a shortening of the quarantine period of 15 dogs now at the animal quarantine station, I did not find it advisable to recommend favorable action by this Board.

#### IMPORTATION OF LIVE STOCK.

In regard to the importation of one stallion which arrived here on the steamship Lurline unaccompanied by the requisite certificates of health, I made a verbal complaint to Castle & Cooke, Ltd., and have now been assured that the secretary of the said company has drawn the Matson Navigation Co.'s attention to the Territorial laws regarding the importation of live-stock and has requested them to use utmost care in following all the rules and regulations of your office, as per enclosed letter.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

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### ASSISTANT VETERINARIAN'S REPORT.

Honolulu, Hawaii, May 31, 1919.

Dr. V. A. Norgaard, Chief, Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu.

SIR:—I have the honor to submit the following report for May, 1919:

## TUBERCULOSIS CONTROL.

	<i>Tested.</i>	<i>Passed.</i>	<i>Condemned.</i>
Albert Aranzo .....	1	0	1
C. H. Bellina .....	145	135	10
C. W. Lucas .....	1	1	0
S. M. Damon .....	5	5	0
H. K. Castle .....	7	7	0
College of Hawaii .....	3	3	0
S. A. Baldwin .....	4	4	0
M. Nee .....	16	15	1
Fred Luning .....	33	28	5
A. Pacheco .....	14	12	2
T. Nakamura .....	32	22	10
T. Nakamoto .....	21	19	2
Y. Tsuda .....	35	33	2
D. Yamashita .....	56	56	0
M. T. Brazon .....	52	52	0
A. Boniza .....	12	12	0

The above list gives a total of 437 head tested, out of which number 404 have been passed and 33 condemned and branded. Of the 33 condemned cows, 10 have been slaughtered, all revealing positive lesions of tuberculosis on autopsy.

## CONTAGIOUS EPITHELIOMA.

There is still considerable demand for vaccine for this disease of poultry. During the month 1500 cc. was distributed among different raisers.

## IMPORTATION OF LIVE STOCK.

During the past month 20 steamers were visited, of which the following carried live stock:

S. S. Tottori, Orient: 2 dogs, 2 cats, owned by crew.

S. S. Annette Rolph, Coast: 3 cats, owned by crew.

S. S. Mono, San Francisco: 8 cts. poultry, Wo Chong; 5 cts. rabbits, American Railway Express Co.

S. S. Korea Maru, Orient: 3 cts. poultry, 1 water hen, Mrs A. H. Isenberg.

S. S. Lurline, San Francisco: 4 mules, Kauai Fruit & Land Co.; 1 Aberdeen Angus bull, 4 Aberdeen Angus heifers, H. F. Damon; 1 Aberdeen Angus bull, 6 Aberdeen Angus heifers, H. K. Castle; 1 Percheron stallion, 4 Jersey heifers, S. A. Baldwin; 3 Guernsey heifers, College of Hawaii; 12 mules, American Factors, Ltd.; 6 polo ponies, Mr. Spaulding; 1 Arabian stallion, R. H. Harris; 1 horse, Lt. Col. C. S. Novt.; 100 mules, U. S. Q. M. Dept.; 2 mules, Schuman Carriage Co.; 10 mules, Hawaiian Pineapple Co.; 13 cts. poultry.

S. S. Sachem, San Francisco: 9 cts. poultry.

S. S. Sonoma, San Francisco: 1 cat, American Railway Express Co.

S. S. Ventura, Sydney: 1 dog, T. Livingston.

S. S. Manoa, San Francisco: 15 cts. poultry, 1 ct. rabbits.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

## By Authority

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### TERRITORY OF HAWAII.—BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.—RULE XX—DIVISION OF PLANT INSPECTION.

#### RULES AND REGULATIONS OF THE BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY CONCERNING THE CONTROL OF INSECT PESTS AND PLANT DISEASES, REPEALING RULE XVII OF THE BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.

The Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii hereby makes the following rules and regulations for the purpose of controlling insect pests and plant diseases in the Territory of Hawaii:

SECTION 1. No infested or infected plant, fruit, melon, vegetable, or root, shall be carried, transported or shipped from any one island in this Territory to any other island in this Territory, if the infestation or infection is of such a character or extent as to endanger the agriculture or plant life of the other island.

SECTION 2. No sugar cane or other plant, or part thereof, shall be carried, transported, or shipped from the island of Oahu to any other island in this Territory unless it has been first examined and, when found necessary, fumigated by, or under the supervision of, the Chief Plant Inspector or his assistants, and properly tagged and certified by any such officer, to the best of his knowledge, to be free from insect pests and plant diseases of danger to the agriculture or plant life of the other islands.

SECTION 3. No taro, lily root, tuber, or root shall be carried, transported or shipped from the island of Oahu to any other island in this Territory unless it is free from soil, except as hereinafter provided, and has been first examined and, when found necessary, fumigated by or under the supervision of the Chief Plant Inspector or his assistants and properly tagged and certified by any such officer, to the best of his knowledge, to be free from insect pests and plant diseases of danger to agriculture or plant life of the other islands.

SECTION 4. No soil, earth, or sand attached to any plant, except as hereinafter provided, or any other soil, earth, or sand (except clean beach sand in bulk), shall be carried, transported, or shipped from the island of Oahu to any other island in this Territory, except that soils, in sufficient quantity to provide inoculation with beneficial soil organisms, which have first been screened or thoroughly examined by the Chief Plant Inspector or his assistants, may be so carried, transported, or shipped when properly tagged and certified by any such officer, to the best of his knowledge, to be free from insect pests and plant diseases of danger to the agriculture or plant life of the other islands.

SECTION 5. Upon written application to the Chief Plant Inspector and upon the approval of the Board of Commissioners of Agriculture and Forestry, a special permit may be issued by the Chief Plant Inspector to ship from the island of Oahu to any other island in the Territory a limited number of plants in soil when it has been shown in said application that such plants are novelties and are of value to agriculture, horticulture, or forestry and that such plants cannot be successfully transported in any other manner; *provided*, however, that such plants have, to the knowledge and satisfaction of the Chief Plant Inspector, been grown in sterilized soil in quarantine or transplanted into sterilized soil and held, up to the time of shipment, under such conditions as would provide reasonable precautions against infestation by insect pests or infection by plant diseases. The Chief Plant Inspector may, in his discretion, subject such shipment to fumigation.

SECTION 6. Any person violating the above rule shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to exceed Five Hundred Dollars (\$500.00), as provided by Section 529, Revised Laws of Hawaii of 1915.

SECTION 7. Rule XVII of the Board of Commissioners of Agriculture and Forestry is hereby repealed.

SECTION 8. This rule shall take effect on June 1, 1919.

Approved:

C. J. McCARTHY,  
Governor of Hawaii.

Honolulu, Territory of Hawaii, May 26, 1919.



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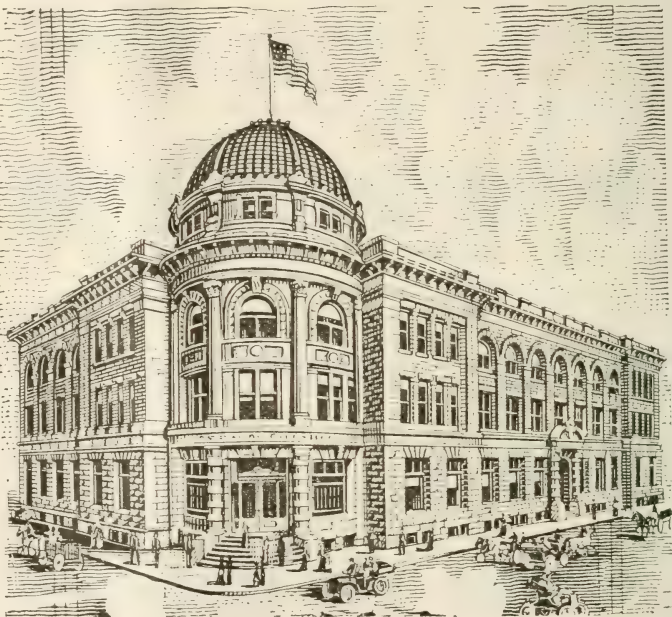


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# THE HAWAIIAN FORESTER AND AGRICULTURIST

JULY, 1919

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# Board of Agriculture and Forestry

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The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

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The Board of Commissioners issues for general distribution to persons in the Territory, annual reports, bulletins, circulars, copies of its rules and regulations, and other occasional papers, which may be had, free, upon application.

A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, JULY, 1919.

No. 7

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Attention is called to the notice, published in this issue, of the Chief Plant Inspector concerning the new federal plant quarantine.

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On July 1 the shipment of cattle interstate without having them properly tuberculin tested was prohibited—with a few exceptions—by a regulation issued by the Secretary of Agriculture.

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The Superintendent of Forestry will begin his course of lectures on elementary forestry and the Hawaiian forests on or about August 1, at the Territorial Summer School which has been opened at Kilauea, Hawaii.

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A report of the activities of the four divisions of this Board, during the fiscal year ended June 30, is contained in this issue. This was prepared for the use of the Governor in submitting his annual report to the Secretary of the Interior.

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Rule XVIII of the Division of Entomology has been amended further to permit the shipment of pineapple crowns, slips and suckers from Honolulu to the Island of Hawaii, where, at Kohala, a new pineapple industry is about to be started. The prohibition against the shipment of pineapple stumps still remains in effect. The amended rule is printed in this issue.

---

Members of the Division of Forestry are on the watch for koa seed, but with little success as yet. While some pods have developed this summer, it has been discovered that the moth borer is already on the job, like the proverbial early worm, and has ridled most of the seeds which the pods contain.

---

Of the total number of 48 camp sites surveyed out at Kokee, in the Na Pali-Kona Forest Reserve, Kauai, 26 have been taken under 10-year camping permits by recreationists who have already begun to enjoy the refreshing climate of that delightful, high-mountain region.

## Notice to Applicants for Trees

---

Honolulu, July 16, 1919.

By Rule XX of the Division of Plant Inspection of the Board of Agriculture and Forestry, which was approved by the Governor on May 26 and became effective June 1, 1919, the shipping of plants (including young tree seedlings) in soil from the Island of Oahu to any other island is prohibited, in order to protect the agriculture and plant life on the other islands from new insect pests which may secure an entrance at Honolulu, the port of entry for the Territory.

For this reason the Government Nursery is not able to send out any more young trees from Honolulu to the other islands. To meet the demands for trees on the other islands the following arrangements have been made:

*Hawaii.* Brother Matthias Newell at Hilo, Hawaii, will, upon due notice in advance, be able to supply trees for that island from the nursery at Hilo.

*Maui and Molokai.* Forest Ranger James Lindsay at Haiku, Maui, will be able to supply, after advance notice, trees for Maui and Molokai from the new nursery at Haiku.

*Kauai.* Arrangements are being made for the establishment of a nursery on Kauai, but until these are completed no trees can be furnished.

C. S. JUDD,  
Superintendent of Forestry.

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## New Federal Plant Quarantine

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The attention of growers, nurserymen, florists and others interested is directed to the fact that on June 1st, 1919, a new Federal Plant Quarantine went into effect under No. 37. It is intended to more fully protect the horticultural and agricultural interests of the Islands and is the result of thought and investigation of experts of the Federal and State Governments. Special quarantines prohibiting entirely the importation of specific plants and plant products from certain countries or localities remain in effect.

Under regulations of Quarantine Notice No. 37, importation of such materials as are permissible for propagation *can only be made under permits issued by the Federal Horticultural Board, U. S. Department of Agriculture, Washington, D. C.* Those contemplating importing plants or plant products intended for propagation should communicate with the Chief Plant Inspector of the Board of Agriculture and Forestry, who has blank forms of application for permits and can give detailed information.

The following classes of nursery stock and other plants and

seeds, except particular nursery stock, plants and seeds, which are governed by special quarantines and other restrictive orders now in force, may be imported without permit:

(1) Fruits, vegetables, cereals and other plant products imported for medicinal, food or manufacturing purposes.

(2) Field, vegetable and flower seeds.

The following nursery stock and other plants and seeds, barring those governed by special quarantines and other restrictive orders now in force, when free from sand, soil or earth, may be imported from countries which maintain inspection, under permit upon compliance with these regulations, but, where a particular purpose is specified, for that purpose and no other:

(1) Lily bulbs, lily of the valley, narcissus, hyacinths, tulips and crocus.

(2) Stocks, cuttings, scions and buds, of fruits for propagation.

(3) Rose stocks for propagation, including Manetti, Multiflora, Brier Rose and Rosa Rugosa.

(4) Nuts, including palm seeds, for propagation.

(5) Seeds of fruit, forest, ornamental and shade trees, seeds of deciduous and evergreen ornamental shrubs and seeds of hardy perennial plants.

A post-office order dated May 27, 1913, as amended December 16, 1913, prohibits the importation by mail of all growing or living plants, seeds and other plant products for propagation except field vegetable and flower seeds.

If a package of nursery stock and other plants and seeds offered for entry includes any *prohibited article*, the entire package will be refused entry.

EDW. M. EHRHORN,

Chief Plant Inspector and Collaborator of Federal Horticultural Board.

## Past Year's Activities

### REPORT OF THE BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY FOR THE FISCAL YEAR ENDED JUNE 30, 1919.

By the separation of the Marketing Division which the Legislature, in special session, made effective on July 1, 1918, this Board operated for the benefit of the Territory during the past fiscal year on four lines—forestry, entomology, plant inspection, and animal industry.

#### FORESTRY.

In the work of forest protection, one of the two main activities of this Division, a turning point was passed by the completion of



the work of setting apart the main forest reserve system in the Territory. During the year, five new reserves were proclaimed by the Governor, an addition was made to one, and an elimination from another. The new reserves consist of the Nonou of 818 acres and the Puu Ka Pele of 4900 acres, on Kauai; the Mokuia of 6290 acres and the Hauula of 9193 acres on Oahu; and the Olaa of 20,030 acres on Hawaii. An area of 104 acres was added to the Makua-Keaau Reserve on Oahu, and from the Puu Ka Pele Reserve on Kauai 415 acres were withdrawn to be turned over to the county for public park purposes. These new reserves include the larger part of forested land which remained to be officially set aside and managed under forestry principles mainly for the conservation of water and the beneficial influence which they have on the surrounding land.

During April, 1919, a detailed check and tabulation was made of the areas of all lands in forest reserves at the request of the Legislature. This revision shows that there are now 47 forest reserves in the Territory, having a total area of 818,739 acres, of which 558,655 acres or 68 per cent is government land.

The work of actual forest protection has progressed at the same time with the completion of this work of forest demarcation. The main efforts have been directed toward ridding the susceptible native forests in the reserves of injurious stock. This has been accomplished in two ways—by the issuing of permits to responsible hunters and ranchmen, and by the construction of new fences and repairing of old fences to prevent the access of stock. By the first method, over 780 head of wild cattle, pigs and goats were eliminated from the reserves during the past year. This work will no doubt be greatly facilitated by a new law which authorizes the killing of branded wild cattle in fenced reserves without compensation to the owner after giving due published notice. Under the second method, a total distance of 14.87 miles of forest reserve boundaries was made stock-proof during the fiscal year by fencing operations.

The force of eight forest rangers on the four main islands have continued to render efficient service in preventing trespass, performing forest work, such as fencing and tree planting, and in the general administration of the forest reserves.

In spite of an unusually dry winter, only four fires have occurred during the year, but these were extinguished at once with small damage to the forest.

The encouragement of tree planting throughout the Territory was continued by the raising and distribution from the three government nurseries of 297,902 seedling trees during the last calendar year. In the interest of protection against the dissemination of injurious insects in soil around the roots of trees, the Division on June 1 discontinued the practice of shipping trees in soil from Oahu to the other islands, and to meet the demand for trees on the other islands it has enlarged the Hilo nursery and is now establishing new nurseries on Maui and Kauai.

Tree-planting operations have been conducted in four different localities on forest reserves, the greatest attention being paid to reforestation on watersheds adjacent to settlements in order to conserve the water supply. A total of 20,000 trees of various species were thus planted out and cared for during the calendar year 1918 and one-half of these consisted of the native koa. A new mountain nursery was started in the Waianae Mountains on Oahu, with others to follow.

A section of high mountain country at Kokee, on the Island of Kauai, was opened up to summer campers under a permit system. A total of 48 camp sites were surveyed out on meadow land along mountain streams, and half of these have already been taken up under ten-year permits.

#### ENTOMOLOGY.

The work of the entomological division, performed by a graduate entomologist and two laboratory assistants, has consisted of introducing, propagating and distributing beneficial insects, advising in regard to agricultural and stock pests, and investigating various projects for improving the control of insects detrimental to agriculture and stock-raising.

The beneficial insects propagated and distributed have been the Mediterranean fruit-fly parasites, the melon-fly parasite, the corn leaf-hopper egg parasite, mealy-bug parasites, etc. A great improvement has been noticed in the fruits attacked by the fruit-fly and the melon-fly, and the corn leaf-hopper egg parasite has been used as a means of checking incipient leaf-hopper attacks. New field work has not been undertaken on account of unsettled conditions abroad and poor transportation facilities, but in the latter part of the year the cooperation of the California State Commission of Horticulture was secured and, through the assistance of their entomologist, a hymenopterous parasite of the pupa or chrysalid of the cabbage butterfly, the worm of which is very destructive to cabbage plants, has been introduced and its naturalization attempted. Both the parasite and its host were originally European insects. An exhibit of economic entomology and demonstration of natural control of insect pests was made at the Territorial fair in June, which attracted considerable attention and proved of great educational value.

The investigational work of the entomologist has consisted of a study of the termites or white ants, the natural control of scale insects with a view to its improvement, the control of the biting flies which attack live-stock, etc. Some time has also been given to the study of several groups of endemic insects as a contribution to scientific entomological knowledge.

#### PLANT INSPECTION.

The work performed by the Chief Plant Inspector and his assistants during the fiscal year consisted of the following:

1. The inspection of all fruit, plants and vegetables coming into the Territory by mail, freight or baggage from foreign countries and the mainland of the United States, to prevent the introduction of pests and plant diseases liable to become injurious to the various agricultural industries of these Islands.

2. The inspection of all fruit, plants and vegetables shipped from Honolulu to all ports of the other islands for the purpose of preventing the spread of any pest existing on Oahu to the adjacent islands. Honolulu being the only port of entry for foreign plants and plant products, it follows that injurious insects and diseases will first become established on Oahu.

During the past fiscal year there arrived at Honolulu, Hilo and Kahului, the only ports in the Territory where fruit or vegetables enter directly, and at which places local inspectors are stationed, 834 vessels. Of these, 292 carried vegetable matter consisting of 240,330 packages of fruit and vegetables and 9551 packages of plants and seeds. Of this amount, 7212 packages were fumigated on account of infestation of various kinds; 456 packages were destroyed by burning on account of infestation or being contraband, and 896 packages were returned to the original shipper as contraband and unmailable.

In addition to the regular steamers, all tramp steamers touching at Honolulu for fuel and supplies are boarded and inspected for vegetable matter. Particular attention is given to those coming via the Panama Canal and other tropical countries in order to prevent the escape of possible pests carried on plants or vegetable supplies in transit. Notices and copies of federal and territorial quarantine laws are furnished to the proper officers of these ships in order that they may be able to take the proper precautions against bringing undesirable insects and plant diseases into the Territory.

The shortage of shipping has materially decreased the importations of fruit and vegetables. Following are some of the larger staples imported:

Oranges .....	25,393 boxes
Cabbage .....	217 crates
Onions .....	29,343 bags
Lemons .....	5,394 boxes
Celery .....	630 crates
Potatoes .....	93,877 bags

War-time conditions have stimulated local efforts at producing these products with such marked success that it is quite possible that home-grown fruit and vegetables will continue on the market after shipping conditions are normal again.

During the fiscal year 696 steamers were attended to in the inter-island inspection, and 11,935 packages of plants, fruit and vegetables were inspected. Of this number 129 packages were



seized and refused shipment on account of infestation or having undesirable soil attached to the roots.

#### ANIMAL INDUSTRY.

This Division, which is mainly engaged in the control and eradication of infectious and contagious diseases of live-stock, has during the past year continued its efforts at suppressing bovine tuberculosis, while the restrictive measures against anthrax have been successfully enforced. The latter disease, which appeared on three of the principal islands, almost simultaneously, during 1917, may now be said to be under complete control. Only two cases, both on the Island of Kauai, occurred during the past year. In combating this disease the Territory has expended nearly fifty thousand dollars, while the loss of live-stock has amounted to nearly the same sum. With the continued vaccination of all cattle in the infected districts there is no longer any cause for apprehension as to its permanent establishment here.

The eradication of bovine tuberculosis has progressed favorably since the Territorial legislature provided ample funds for the indemnification of the owners of infected cattle. The 1917 as well as the 1919 legislature appropriated \$20,000 for this purpose, and it is expected that the end of the present fiscal year will see the amount of infection reduced to less than one per cent.

No case of glanders or epizootic lymphangitis has come to notice during the past year, and only one outbreak of swine plague and necrotic enteritis has been recorded. Hog cholera has not occurred in the Territory for several years.

Live-stock importations have increased to a certain extent since the ending of the war. A considerable number of good dairy cows have been imported, while the beef cattle breeders have brought in some of the best blood, especially Herefords, obtainable in the States. Hog-raising continues on the increase, and only smoked meats of this class are now imported.

Owing to the continued high cost of feed and transportation, the dairy industry remains confined to the production of the requisite amount of milk, which retails at fifteen cents per quart, while practically all butter and cheese is imported. The same applies to poultry and eggs. The disease known as chicken pox or sore-head is quite prevalent, and even though vaccination is practised to a considerable extent, it is difficult to raise chickens which are hatched later than the end of May.



# Division of Forestry

Honolulu, Hawaii, July 16, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of June, 1919:

## TREE PLANTING.

During the month 4981 trees were planted out on forest reserves as follows: 503 koa in Makiki, in the Honolulu Watershed Forest Reserve; and at Mikilua, in the Luualualei Forest Reserve, Oahu, 870 koa, 570 monkey-pod, 1748 silk oak, 1110 red gum and 180 sappan.

A small potting and tool shed was erected on the Waiahole Forest Reserve, Oahu, and a further supply of mahogany trees sent over preparatory to the planting on that important water reserve.

## FIRE PROTECTION.

No fires were reported, fortunately, during June, but as a precautionary measure all District Fire Wardens were reminded of the fire danger by the attached circular letter of June 5, which has resulted in the posting of a great many fire warnings.

On June 24, at the request of the manager of the Laupahoehoe Sugar Plantation, a commission as Assistant District Fire Warden at Laupahoehoe, Hawaii, was issued to Mr. Joe J. Ignacio, to take the place of Mr. H. S. Rickard, deceased.

## KOKEE PERMITS.

During the month the following permits were issued for the Kokee camps, Kauai:

Camp No.	Permittee.	Acreage.	Ann. Rental.
18	Hawn. Trail and Mt. Club.....	0.9	\$9.00
35	Elsie H. Wilcox.....	0.8	8.00
36	Mabel I. Wilcox.....	0.6	6.00
37	R. D. Israel.....	0.4	4.00
38	E. M. Cheatham.....	0.3	3.00

## FAIR EXHIBIT.

The working erosion model again displayed at the Second Territorial Fair held June 9-14, to show the beneficial effect of a forest cover on the runoff, attracted more attention and favorable comment than ever, and was much admired as a very instructive object lesson by all who saw it.

## FOREST PROTECTION.

The fencing projects reported last month are progressing on Maui and Hawaii.

On June 20 another visit was made to the Pupukea Forest Reserve and additional standard pipe monuments placed on the reserve boundaries.

## BOTANICAL BULLETINS.

On June 9 the following two illustrated botanical bulletins by Consulting

Botanist J. F. Rock came off the press and were distributed: No. 5, "The Arborescent Indigenous Legumes of Hawaii," and No. 6, "The Hawaiian Genus Kokea, a Relative of the Cotton."

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, July 15, 1919.

Superintendent of Forestry, Honolulu, T. H.

Dear Sir:—I herewith submit a report of the work done during the month of June:

### NURSERY.

#### DISTRIBUTION OF PLANTS.

Sold .....	108	pot-grown plants
Others, including Forest Reserves...	408	" "
Total .....	516	" "

#### COLLECTIONS—GOVERNMENT REALIZATIONS.

Collections on account plants sold.....	\$ 5.15
Rent of Office building, Nursery grounds, for the months of April and May .....	70.00
Total .....	\$75.15

### PRESERVATION FOREST RESERVES.

#### COLLECTIONS FOR QUARTER ENDED JUNE 30, 1919.

Rents and fees .....	\$ 32.50
Sale of charcoal.....	14.95
Sale of black sand.....	55.00
Sale of 54 cords dead wood.....	54.00
Fees for Kokee Camp Site (Kauai).....	226.98
Total .....	\$383.43

### MAKIKI VALLEY.

The work done at this station was principally routine. We are now devoting our time to the building up of a stock of trees for the coming planting season.

### HONOLULU WATERSHED.

In Opu Valley 503 koa trees were planted. Other work done consisted of hoeing and clearing.

### ADVICE AND ASSISTANCE.

The writer has at the request of the Alewa Heights Improvement Club

submitted a plan for the planting of trees along the roads, etc., in the district, and the same will be brought before the club at its next meeting.

At the request of Captain Hawkins, who is in charge of the beautifying of the grounds at Fort Kamehameha, the writer paid a visit to the post and made suggestions in regard to the laying out of the grounds and planting trees, etc.

At the request of people in and around the city, the following calls were made, also advice given otherwise: Calls made, 6; advice by telephone, 4; advice given people calling, 8.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## Division of Entomology

Honolulu, Hawaii, June 30, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—During the month of June the insectary handled 16,600 pupae of the melon fly, from which there were bred 1929 females and 1683 males, *Opius fletcheri*.

The distribution of parasites was as follows:

### MELON FLY PARASITE.

	Females.	Males.
<i>Opius fletcheri</i> .		
Oahu:		
Nuuanu .....	70	70
Kalihi .....	185	140
Maunawai .....	800	850
Pupukea .....	50	50
Hawaii:		
Kamuela .....	80	60
Glenwood .....	240	220

### FRUIT-FLY PARASITES.

<i>Tetrastichus giffardianus</i> .		
Oahu:		
Kaimuki .....	300	
Makiki .....	500	
<i>Opius humilis</i> .		
Oahu:		
Kaimuki .....	90	105
Makiki .....	80	50
<i>Diachasma fullawayi</i> .		
Oahu:		
Kaimuki .....	80	10
Makiki .....	100	30
<i>Diachasma tryoni</i> .		
Oahu:		
Kaimuki .....	195	145
Makiki .....	200	150
Pupukea .....	100	60

*Dirhinus giffardi.*

Oahu: Nuuanu ..... 300

*Galesus silvestri.*

Oahu: Nuuanu ..... 650

## CORN LEAF-HOPPER PARASITE.

*Paranagrus osborni.*

Oahu:

Makiki Nursery ..... 6200

Kalihi ..... 3500

Hawaii:

Kailua ..... 5700

Kukuihaele ..... 400

Honokaa ..... 400

Kauai:

Kilauea Sugar Plantation Co. .... 4800

Kealia ..... 800

Much time was spent during the first part of the month in the preparation of an exhibit for the Territorial Fair. In addition, the Entomologist acted as Chief Plant Inspector until June 17.

Respectfully submitted,

D. T. FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, June 30, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—I respectfully submit my report of the work done by the Division of Plant Inspection for the month of June, 1919, as follows:

During the month 51 vessels arrived at the port of Honolulu, 20 of which carried vegetable matter. Four came via the Panama Canal. The following disposal was made of the various shipments:

Passed as free from pests..	598 lots	7475 packages
Burned .....	112 “	112 “
Fumigated .....	1 “	1 “
Returned .....	2 “	2 “
Total inspected .....	713 “	7590 “

Of these shipments, 7310 packages arrived as freight, 177 packages as mail and 103 packages as baggage.

## RICE AND BEAN SHIPMENTS.

During the month 17,758 bags of rice and 2017 bags of beans arrived from Japan and were found free from dangerous insect pests.

## PESTS INTERCEPTED.

Approximately 4355 pieces of baggage belonging to immigrants from



foreign countries were examined, from which 22 lots of fruit and 86 lots of vegetables were taken and destroyed.

On June 2 a package of orange plants in the mail from United States was fumigated for an infestation of purple scale.

On the same date one rose plant and one azalea in the baggage from Japan were destroyed, being a prohibited importation.

On June 2 a package of seed corn in the mail from Japan was returned as unmailable.

On June 13 a package of plants in the baggage from Japan was burned, being a prohibited importation.

On June 17 a package of tulip bulbs in the mail from Portugal was returned as unmailable.

#### HILO INSPECTION.

Brother M. Newell, Inspector for Hilo, reports the arrival of seven vessels at the port of Hilo, three of which carried vegetable matter, consisting of 67 lots and 1547 packages, all of which were free from pests.

#### KAHULUI INSPECTION.

Mr. Edwin C. Moore, acting for Mr. W. J. Cooper, Inspector at Kahului, reports the arrival of five vessels at the port of Kahului, one of which carried vegetable matter, consisting of nine lots and 450 packages, all of which were free from insect pests.

#### INTER-ISLAND INSPECTION.

Fifty-eight steamers plying between Honolulu and other Island ports were attended and the following were passed as free from pests:

Sugar cane .....	11 packages
Taro .....	264 bags
Vegetables .....	244 packages
Plants .....	132 packages
Fruit .....	112 packages

Total passed ..... 763 packages

Fourteen packages of plants and one package of sugar cane were refused shipment on account of infestation, undesirable soil and not complying with the regulations.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry

Honolulu, Hawaii, July 18, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of June, 1919:

#### THE ANTHRAX SITUATION ON KAUAI.

As stated in my report for last month, the Deputy Territorial Veterinarian, Dr. Golding, had reported that the vaccination for anthrax in a

considerable number of cases had been followed by large swellings at the place of injection; that is, on the side of the neck. In all, more than thirty cases occurred, of which four resulted in death, all being among the ranch saddle horses on the Princeville Plantation. Though more than 1700 head of cattle were treated at the same time, no similar cases occurred among them. The inference was made that either the vaccine was too strong or else that the hypodermic needles had not been disinfected. A number of more or less mysterious circumstances made it desirable that an investigation be made, and on June 16 I left for Hanalei. Upon arrival, I found five horses affected, three being new cases just brought in from the saddle-horse paddock. All were, as previously described, affected on the right side of the neck, which is the side on which, as a rule, the anthrax vaccine is injected, while the serum is applied to the left side. Incidentally, it may be mentioned that Dr. Golding invariably handles the vaccine while either the manager or the foreman injects the serum, the two injections being made simultaneously as the animals pass through a chute.

The swellings were, as stated, all on the right side of the neck, the side where Dr. Golding was supposed to have made the injections, and resembled in every respect the typical lesions resulting from the intradermal injection of mallein into a horse affected with glanders.

In all cases reported by Dr. Golding and observed by us, the swelling would appear suddenly and develop very quickly; that is, in the course of a few hours. Horses which had been ridden the day before would be found in the morning with a swelling eight to ten inches in diameter and two to three inches thick, or else, with a small swelling which, in the course of the forenoon, would reach the above dimensions. They would then either recede or else continue to swell until they reached upward toward the jaw and downward along the neck, chest and abdomen, resulting in death usually within 24 hours.

The nature of these swellings was oedematous (doughy), hot, and very sensitive to the touch, and they were as a rule accompanied by a rise in temperature, loss of appetite and general malaise.

Recovery was in all cases slow, the resorption requiring a week or two, even though the temperature might become normal shortly after the swelling had ceased to enlarge.

The microscopic examination of fluid drawn from these swellings or obtained on post-mortem failed to reveal the anthrax bacillus, even though many dozen slides were examined. Only the hemorrhagic septicemia organism was present, and the internal lesions as observed on post-mortem corresponded in every respect to those which characterize this disease.

The most interesting fact in connection with these fast-appearing swellings is, however, that they did not occur until two or five weeks after vaccination. This precludes any possible relation between the two, but does not explain why all the swellings should occur on the right side of the neck and only among the saddle horses that were kept in the stable paddock and easy of access; nor why no cattle became affected, not even weanling calves, which would naturally be more susceptible than mature animals.

I expressed to the manager my conviction that the swellings were produced with a hypodermic syringe, and put it up to him to see to it that nobody tampered with his stock. Since that time no more cases have occurred.

## BOVINE TUBERCULOSIS ON KAUAI.

While on Kauai I demonstrated for Dr. Golding the intrapalpebral tuberculin test and familiarized him with the enforcement of the new compensation act. For this purpose two herds of pure-bred Ayrshire cattle were tested, among which only one reactor was found. This cow was slaughtered and found but slightly affected with tuberculosis. There is consequently little danger of the further spread of the disease among these very valuable animals.

It is recommended that Dr. Golding be authorized to move to a more central location, as either Kapaa or Lihue, as otherwise it will be very difficult for him to do the testing on the Waimea side and attend to the meat inspection on the Princeville Plantation twice a week.

Very respectfully,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, July 16, 1919.

Dr. V. A. Norgaard, Chief, Division of Animal Industry, Bureau of Agriculture and Forestry, Honolulu:

Dear Sir:—I have the honor to submit the following report for the month of June, 1919:

### TUBERCULOSIS CONTROL.

The following dairies were tested during the month:

	Tested.	Passed.	Condemned.
F. Figisue .....	22	21	1
M. Nishimoto .....	22	22	0
S. Saiki .....	13	13	0
S. Hirata .....	40	37	3
Pedro Martin .....	15	14	1
F. Gonzallas .....	10	10	0
Ant. Compos .....	12	11	1
R. Compos .....	1	1	0
S. Shumizu .....	20	20	0
Pedro Alias .....	7	7	0
J. Horigo .....	8	7	1
C. T. Arozo .....	17	17	0
M. Gagaro .....	10	10	0
Pedro Diaz .....	10	10	0
John Simon .....	25	25	0
Heimans & Freitas .....	16	15	1
M. S. Salado .....	5	5	0
Mateo Salado .....	2	2	0
Antone Soares .....	25	24	1
J. Gonzallas .....	20	20	0

The above list shows a total of 300 head tested, out of which number 291 passed and 9 were condemned and branded.

Besides the above testing, autopsies were performed on 22 head of condemned cattle. In all cases positive lesions of tuberculosis were revealed.

### TERRITORIAL FAIR. ....

A large part of the time of this Division was taken up with the live-stock exhibit of the Fair. In this exhibit were shown animals from the various ranches of very superior quality. On the whole the exhibit was far better staged than the one at the first fair, and if the same degree of improvement is equalled at subsequent fairs, this Territory will soon stage a live-stock exhibit which will be excelled nowhere on the mainland of the United States.

Details of the dressed carcass contest will be given in a later report.

## IMPORTATIONS OF LIVE-STOCK.

A total of 14 steamers were met and inspections made, of which number the following were found to carry live-stock consigned to this port:

S. S. China, San Francisco—1 dog, Mrs. E. Zohlout.

S. S. Lurline, San Francisco: 1 draft stallion, C. B. Miles; 1 Jersey bull, Amer. R. Ex. Co.; 5 crates lions, H. A. de Vaux; 3 crates poultry, J. C. Rued.

S. S. Columbia, Orient: 1 dog, Miss Ruth Lissak.

S. S. Sachem, San Francisco: 1 Hereford bull, W. E. Bellina; 5 cases poultry, 1 cat, Amer. Ex. Co.; 1 crate ducks, L. D. Robinson.

S. S. Shinyo Maru, Orient: 1 dog; 18 ets. of birds, Mrs. A. H. Isenberg.

Respectfully submitted,

LEONARD N. CASE,  
Asst. Territorial Veterinarian.

## By Authority

TERRITORY OF HAWAII.  
BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.

### FURTHER AMENDMENT TO RULE XVIII OF THE DIVISION OF ENTOMOLOGY OF THE BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY CONCERNING THE CONTROL OF FUNGUS DISEASES ON PINEAPPLES.

The Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii hereby further amends Rule XVIII of the Division of Entomology concerning the control of fungus diseases on pineapples in order to permit the shipment of pineapple fruit, crowns, slips and suckers from Honolulu to ports on the islands of Hawaii and Molokai so that the said rule shall read as follows:

The Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii hereby makes the following rule and regulation for the purpose of preventing the spread of a fungus disease upon pineapples which has made its appearance upon the islands of Kauai and Oahu:

Section 1. All persons and corporations are hereby prohibited from carrying, transporting, or shipping from the islands of Kauai and Oahu to any other island in this Territory any pineapple fruit, pineapple plant, or pineapple sucker; provided, however, that clean pineapple fruit, crowns, slips and suckers may be shipped from Honolulu to ports on the islands of Hawaii and Molokai.

Section 2. No pineapple fruit, pineapple plant, or pineapple sucker shipped from any port of the islands of Kauai and Oahu to any other port in this Territory shall be allowed to be landed, excepting clean pineapple fruit, crowns, slips and suckers shipped from Honolulu to ports on the islands of Hawaii and Molokai. Inspectors and other duly authorized agents of the Board of Agriculture and Forestry are hereby empowered to examine and inspect all freight, baggage, and belongings arriving at any port of the Territory from the islands of Kauai and Oahu and to destroy any and all pineapple fruits, plants or suckers found among such freight, baggage or belongings, excepting clean pineapple fruit, crowns, slips and suckers arriving at ports on the islands of Hawaii and Molokai from Honolulu.

Section 3. Any person violating the above rule shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to



exceed Five Hundred Dollars (\$500.00) as provided by Section 529 of the Revised Laws of Hawaii of 1915.

Section 4. This Rule, as amended, shall take effect upon its approval by the Governor.

Approved this 18th day of July, 1919.

C. J. McCARTHY,  
Governor of Hawaii.

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(1918)

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Cyril Golding, *Deputy Territorial Veterinarian, Kauai.*

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

AUGUST, 1919

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NO. 8



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# The Hawaiian Forester and Agriculturist

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Entomology, Animal Industry  
and Agriculture.

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# Board of Agriculture and Forestry

## DIVISION OF FORESTRY.

### FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

## PUBLICATIONS FOR DISTRIBUTION.

The Board of Commissioners issues for general distribution to persons in the Territory, annual reports, bulletins, circulars, copies of its rules and regulations, and other occasional papers, which may be had, free, upon application.

A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, AUGUST, 1919.

NO. 8

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The slight summer showers have made it possible for the Division of Forestry to continue tree planting during July in certain localities.

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Of the total number of 350 dairy cattle tested during July for bovine tuberculosis, less than one per cent was found to be afflicted with this disease.

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Attention is called to the reference in the report of the Superintendent of Forestry and to the special article in this number concerning the use of forest reserve lands as bird sanctuaries.

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The value of bacterins as an effective cure for swine plague was clearly demonstrated by the Territorial Veterinarian at the outbreak of this disease among hogs at the Laie plantation on July 21, when the trouble was brought to an abrupt end by curative doses of this remedy.

---

Copies of Prof. Rock's botanical bulletins No. 5, "The Arborescent Indigenous Legumes of Hawaii," and No. 6, "The Hawaiian Genus *Kokia*, a Relative of the Cotton," are still available at the Government Nursery for those who desire them.

---

The voluntary and prompt assistance rendered by Messrs. A. W. Eames, H. A. White, A. A. Wilson and enlisted men from Castner, under Major Ryder, in extinguishing the grass fire on July 6 on the eastern slopes of the Waianae mountains, Oahu, is very much appreciated by this Board.

---

As will be seen by the Chief Plant Inspector's report no chances are taken with plant and seed importations which include material which is prohibited entry by regulation. It is only by enforcing the regulations and destroying or returning prohibited material that the danger of new infestations of insect and plant pests can be kept down to a minimum.

---

During the month Entomologist Fullaway distributed throughout the Territory 5895 parasites on the melon fly, 6560 parasites on the fruit fly, and 29,700 parasites on the corn leaf hopper, or a total of 42,155. This is a regular part of the propagation and distribution of beneficial insect work of the Division of Entomology which is appreciated by fruit growers and the small agriculturist.

## Bird Sanctuaries

---

Following out a recently established policy of the Division of Forestry of the Board of Agriculture and Forestry to manage the government lands in forest reserves throughout the Territory so that they will serve as sanctuaries where wild game and other birds may breed and multiply unmolested, hereafter, and until further notice, no permits will be issued for hunting birds on such lands.

This stand is taken particularly to encourage the increase of the golden pheasant which is not so plentiful in parts of the Territory as it used to be and on which the 1919 Legislature has placed a closed season of five years on the Island of Hawaii. In view of the damage done by the mongoose in preventing the spread of the pheasant combined with the numbers eliminated by hunters during the open season, from October 1 to January 31, it seems only reasonable that the pheasant should have some localities where it can have a chance for increasing. The foothill country in the forest reserves is a suitable location for this purpose.

Hunters who have been accustomed to pursue the pheasant in the Kula Forest Reserve on the slopes of Haleakala on Maui, may be disappointed at this ruling but should favor the plan because it will tend to increase a greater supply of birds on adjacent lands in this same region.

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## City Watershed Protection

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Eighty-seven cities and towns of Oregon, Washington and Alaska derive the water supply for their municipal water works from the national forests of the North Pacific district, according to a report just compiled in the District Forester's office. Of these towns thirty-eight, having an estimated population of 392,000, are in Oregon; forty-two, with a population of 634,000, are in Washington; and seven, with 15,000 people, are in Alaska.

The larger towns of the district using national forest water are Portland, Eugene, Oregon City, Roseburg, Albany, Medford, Ashland, Baker, La Grande, The Dalles, and Bend, Oregon; Seattle, Tacoma, Everett, Walla Walla, Yakima, Wenatchee, Aberdeen, Port Angeles, Ellensburg, and Roslyn, Washington; and Anchorage, Cordova, Ketchikan, and Petersburg, Alaska.

The Forest Service cooperates with the towns in protecting their watersheds from fire and trespass, and every effort is made to

keep the water free from any sort of contamination. Formal co-operative agreements between the Secretary of Agriculture and the city officials are in effect providing for this protection of the watersheds of Tacoma and Walla Walla in Washington, and Oregon City, The Dalles, Dufur, Wallowa, Baker, and Toledo in Oregon.

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## Forest Service and Grazing

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Sheep and cattle men from thirteen western states met at Salt Lake City, July 21, for the purpose of discussing future action by the stockmen to secure some remedial legislation in connection with the use of the public lands for grazing purposes. An association called the United Stockmen's Association was organized, the preamble of its constitution setting forth that the purpose of the association was to insure control of the unappropriated, unclassified public range, under the jurisdiction of the Department of Agriculture.

The meeting was attended by Secretary Houston and by Messrs. Potter and Barnes of the Forest Service.

With only one dissenting vote, registered by the Wyoming delegation, they adopted the following resolution:

"Whereas, indiscriminate grazing on public land has resulted in great reductions in forage, and

Whereas, such indiscriminate grazing has been brought about by the lack of supervision by the federal government, and

Whereas, this condition results in great economic loss to the nation; now therefore be it

Resolved by this convention of stockmen, representing the livestock interests of the states of Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, South Dakota, Utah, New Mexico, Washington, Nebraska and Wyoming at a meeting in Salt Lake City, July 21, 1919, that congress be urged to initiate legislation to the end that grazing on the unappropriated public domain be regulated by the federal government under the supervision of the Department of Agriculture with the interests of the livestock men properly safeguarded, and be it further

Resolved, that we urge the heartiest cooperation between the Department of Agriculture and Department of the Interior that this result be most speedily obtained."

The dissenting vote cast by the Wyoming delegation is believed to have been cast in order to insure that the interests of the returning soldiers, sailors and marines would be protected, and also to direct attention to the soldiers and sailors land measure sponsored by Secretary Lane which is now up for consideration.



## Purchase of Forest Lands

---

The National Forest Reservation Commission has just approved for purchase 48,581 acres of land for National Forests in the White Mountains, Southern Appalachians, and Arkansas.

The largest tracts are in the White Mountains, where 31,020 acres in Carroll and Grafton Counties, N. H., and 1,220 acres in Oxford County, Me., were approved for purchase at an average price of \$7.15 per acre. These lands include the scenic peaks of Mount Chocorua and Mount Paugus, much visited by tourists and made accessible by trails maintained by the Chocorua Mountain Club.

### LAND IN OTHER STATES.

In Arkansas the approval for purchase covered 6,573 acres, largely in Pope, Stone, Crawford and Baxter Counties, at an average price of \$3.11, and 2,652 acres in Polk, Scott, Montgomery and Yell Counties, at an average price of \$3.71.

In Alabama, in Winston and Lawrence Counties, 3,144 acres were approved for purchase at \$4.52 per acre.

In Virginia, in Amherst County, 1,229 acres were approved at an average price of \$7.42, and in Augusta County, 1,407 acres at a price of \$5.52.

In North Carolina, in Watauga and Caldwell Counties, 332 acres were purchased at an average price of \$9.37 per acre; in Yancey County, 144 acres were approved at \$12 per acre, and in Macon County 600 acres at \$8 per acre.

In South Carolina, in Oconee County, 190 acres were approved for purchase at \$5 an acre; and in Georgia, in Rabun County, 70 acres at \$4.25.

### TIMBER AFFECTS PRICES.

The difference in the price of the various tracts of land approved for purchase is due to the difference in the amount of timber, its quality and accessibility.

To date the National Forest Reservation Commission has approved for purchase 1,751,115 acres for National Forest purposes in the mountain areas of the eastern National Forests.

## Airplanes Find Forest Fires

---

Reports to the Forest Service, United States Department of Agriculture, from the national forests in California, where Army aviators are making daily flights in search of forest fires, indicate that the innovation has been decidedly successful and that air patrols of the forests will prove so valuable that they will eventu-

ally become a permanent part of the work to shield the great woodlands from conflagrations. Numerous fires have been discovered in their early stages by the aviators and have been reported immediately to the forest rangers. It is believed that considerable loss has been prevented by such early discovery. Lack of suitable landing places in this rugged country has proved a handicap in some instances and has caused a belief in some quarters that dirigible balloons will finally be found more suitable than airplanes for forest flying.

---

## Division of Forestry

---

Honolulu, Hawaii, Sept. 5, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of July, 1919:

### TREE PLANTING.

During the month 2050 trees were planted out on forest reserves on Oahu, as follows: 329 koa on the Honolulu Watershed Reserve in Makiki, and 1621 red gum and 100 monkey pod trees at Mikilua, in the Lualualei Forest Reserve.

### FOREST FIRE.

On Sunday, July 6, at 3:30 p. m., a fire started in the grass near some bee hives just above No. 5 pineapple field of the California Packing Corporation at Lihue on the east slope of the Waianae Mountains, Oahu, and on account of the very dry conditions spread up the slope and covered about 75 acres before it could be extinguished. The area burned over was covered with grass and brush and a very few trees. The fire was first discovered by Mr. A. W. Eames of Wahiawa, who, with Mr. H. A. White, promptly set out with a gang of laborers from the pineapple fields. District Fire Warden A. A. Wilson followed with assistance from the army at Castner under Major Ryder with the result that the fire was completely under control before nightfall. The immediate and voluntary response of these men and their efficient labor in extinguishing the fire so promptly are very greatly appreciated. A subsequent examination of the burned area disclosed the fact that the fire must have been started by the smoking torch of some one who was stealing honey, for the top of one hive had been removed and one frame taken out. Unfortunately it has not been possible to obtain any clue as to who this was.

### GRAZING AT HALONA.

On July 10, I visited Halona valley in the Lualualei Forest Reserve in company with Mr. L. L. McCandless to investigate grazing conditions and have since made a special report on the subject. At the time of this visit, 26 wild goats in the reserve were exterminated and complete utilization made of all but two of them.

## KOOKEE PERMITS.

During the month the following permits were issued for Kokee camps on Kauai:

Camp. No.	Permittee.	Acreage.	Annual Rental.
15 A.....	Dr. George B. Tuttle.....	1.1	\$11.00
27.....	Mrs. A. J. Gignoux and Mrs. C. G. Bockus	.7	7.00
30.....	Richard B. Gurrey .....	.9	9.00

## FOREST FENCING.

The fencing of the boundaries of the Kula Forest Reserve, Maui, in co-operation with adjacent private owners was continued during the month.

A stretch of fence .30 mile in length was completed during the month on a part of the boundary of Section C of the Olaa Forest Park Reserve, Olaa, Hawaii, along the Volcano Road in cooperation with Mr. Jos. Zem-bik, the owner of adjacent Lot 181.

## MISCELLANEOUS.

Six signs, to the effect that the shooting of birds was prohibited, were painted on tin and sent to Kauai to be posted on forest reserve boundaries, in following out the policy of having forest reserve lands serve as bird sanctuaries where they can breed and multiply without molestation.

A portion of my time during the month was spent in the preparation of lectures on forestry to be delivered at the Territorial Summer School in camp at Kilauea, Hawaii, for which island I left Honolulu on July 26.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, July 31, 1919.

Superintendent of Forestry, Honolulu, T. H.

Dear Sir:—I herewith submit a report of the work done during the month of July:

## NURSERY.

## Distribution of Plants—

	In Seed Boxes.	In Transplant Boxes.	Pot Grown.	Total.
Sold .....		50	97	147
* Gratis .....	10,350	1,150	1,201	12,701
	10,350	1,200	1,298	12,848

## COLLECTIONS.

Collections on account plants sold.....	\$ 5.30
Rent of office Nursery grounds .....	35.00
	<hr/> \$40.30

## PLANTATION COMPANIES AND OTHER CORPORATIONS, ETC.

The distribution of plants during the month under this heading amounted to 5,000 in transplant boxes and 2,000 pot grown, total 7,000.

\* Including military posts and forest reserves, etc.

We have on hand at the nursery and at Makiki Station a large variety of forest and ornamental trees ready for planting out. We are also propagating for the coming planting season quantities of forest and ornamental trees of many species.

#### COLLECTION OF SEED.

The seed season is now on and the seed boys are busy collecting. Our success in collecting koa seed has not been so great as we would have liked, nevertheless we have managed to get some good seed.

We have received from Mr. P. J. Wesster, Agricultural Advisor, Zamboanga, P. I., seeds of *Dracaena* sps., *Gynura saramontosa* and *Parkia timoriana*, which we hope will prove to be valuable as well as ornamental.

#### MAKIKI STATION.

Our efforts at this station are directed toward the propagating of large quantities of trees to be ready for the rainy season. We intend to have ready enough trees and plants to meet all demands.

#### HONOLULU WATERSHED PLANTING.

Koa trees to the number of 329 were planted in Opu Valley during the month. Other work done consisted in hoeing and clearing off.

#### ADVICE AND ASSISTANCE.

The writer has made the following calls and otherwise given advice and assistance as follows: Calls made 6; advice by telephone 4; advice given at Nursery 8.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

---

## Division of Entomology

---

Honolulu, Hawaii, August 26, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—During the month of July the insectary handled 22,200 pupae of the melon fly, from which there were bred 3,246 females and 2,446 males, *Opius fletcheri*.

The distribution of parasites was as follows:

#### MELON FLY PARASITE.

*Opius fletcheri*.

Oahu:

	Females.	Males.
Kalihi .....	100	100
Moanalua .....	500	700
Manoa .....	25	30
Moilili .....	800	900
Pearl City .....	400	600
Kailua .....	830	620
Waialua .....	120	170



## FRUIT FLY PARASITES.

*Dirhinus giffardi.*

Oahu:		
Nuuanu .....		150

*Diachasma tryoni.*

Oahu:		
Moanalua .....	200	180
Kalihi .....	525	410
Nuuanu .....	100	105
Hawaii:		
Honokaa .....	70	80

*Galesus silvestri.*

Oahu:		
Nuuanu .....		200

*Tetrastichus giffardianus.*

Oahu:		
Moanalua .....		700
Kalihi .....		1600
Nuuanu .....		400
Hawaii:		
Honokaa .....		50

*Diachasma fullawayi.*

Oahu:		
Nuuanu .....	10	5
Moanalua .....	25	...
Kalihi .....	70	25
Hawaii:		
Honokaa .....	10	...

*Opius humilis.*

Oahu:		
Nuuanu .....	25	50
Moanalua .....	420	230
Kalihi .....	525	330
Hawaii:		
Honokaa .....	35	30

## CORN LEAF-HOPPER PARASITE.

*Paranagrus osborni.*

Oahu:		
Makiki Nursery .....		12,200
Manoa .....		2,000
Wahiawa .....		2,200
Hawaii:		
Kamuela .....		8,100
Kauai:		
Kilauea Plantation Co.....		5,200

Respectfully submitted,

D. T. FULLAWAY,  
Entomologist.

# Division of Plant Inspection

Honolulu, Hawaii, July 31, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—I respectfully submit my report of the work carried on by the Division of Plant Inspection for the month of July 1919, as follows:

During the month 42 vessels arrived at the port of Honolulu, 23 of which carried vegetable matter and 3 vessels came through the Panama Canal Zone. The following disposal was made of the various shipments:

Passed as free from pests	1240 lots	23,239 packages
Burned.....	73 “	73 “
Fumigated.....	8 “	8 “
Returned.....	5 “	5 “
Total inspected.....	1326 “	23,325 “

Of these shipments 23,051 packages arrived as freight, 114 packages as mail and 160 packages as baggage.

## RICE AND BEAN SHIPMENTS.

During the month 18,865 bags of rice, including 150 bags from Hong-kong, China, and 1766 bag of beans arrived from Japan and were found free from dangerous insect pests.

## PESTS INTERCEPTED.

Approximately 4332 pieces of baggage belonging to immigrants from foreign countries were examined, from which 22 lots of fruit and 32 lots of vegetables were taken and destroyed.

On July 8, 2 packages of seeds of *Rubus* from Manila and one package of mango seeds which was badly infested with decay mites were destroyed.

On July 14 a package of *Gladiolus* bulbs from the United States infested with *Aphis* and one package Castor Beans from India were fumigated, the latter precautionary. Also one package of Napier Grass from the United States was fumigated as a precaution.

On July 17, 3 plants found in the baggage of an immigrant from Japan as well as 4 packages of seeds were seized and destroyed, being prohibited.

On July 20 a package of peas found in the postoffice from Japan was found badly infested with *Bruchus pisorum* and was fumigated with carbon bisulphide before delivery.

On July 21 a package of tree seeds from Calcutta, India, came in the mail and was seized and destroyed, being contraband.

On July 23 a case of Staghorn ferns from Sydney was returned to the storekeeper of the vessel who was bringing it for a friend, it being a prohibited article. Also a package of tree seeds from Sydney found in the mail was returned as unavailable.

Also a package of tree seeds by mail from Manila was destroyed as contraband with the consent of the owner.

On July 23 a package of plants from British Columbia came by mail and was returned as unavailable.

On July 26, 2 *Cycas revoluta* were found in the baggage of a Japanese immigrant and an ornamental plant in the baggage of an immigrant from Manila, both of which were seized and destroyed.

On July 26, 4 packages of vegetable seeds and herbs came by mail from Japan and were infested with *Catarama Mexicana* and were fumigated before delivery.

#### HILO INSPECTION.

Brother M. Newell, Inspector of Hilo, reports the arrival of 8 vessels at the port of Hilo, one steamer carrying vegetable matter; one steamer and two sailing vessels carrying lumber. There were 92 lots and 1830 packages of fruits and vegetables which were passed as free from pests.

#### KAHULUI INSPECTION.

Mr. Edwin C. Moore, Acting Inspector at Kahului, reports the arrival of six vessels at the port of Kahului, one of which carried fresh fruits and vegetables consisting of 12 lots and 364 packages, all being free from pests.

#### INTER-ISLAND INSPECTION.

Sixty steamers plying between Honolulu and the other island ports were attended and the following shipments were passed as free from pests:

Taro.....	456 packages
Fruit.....	138   “
Plants.....	147   “
Vegetables.....	316   “
Seeds.....	6   “
Total.....	1063   “

Sugar cane (H. S. P. A.) 85 cases, of which 80 cases were fumigated as precautionary.

Thirty-three packages of plants and 5 packages of fruits were refused shipment on account of infestation, undesirable soil and not complying with the regulations.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry

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Honolulu, Hawaii, Sept. 4, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—I beg to submit herewith a report of the work of the Division of Animal Industry for the month of July, 1919.

#### TUBERCULOSIS CONTROL.

During the past month a total of 350 head of dairy cattle located in nineteen dairies were tuberculin tested, the results of which are given in the appended report of the Assistant Territorial Veterinarian.

Under the date of July 18, I received a communication from the Commanding General of Schofield Barracks, Brigadier General H. C. Hodges, Jr., to the effect that a case of generalized tuberculosis had been found by one of the post veterinarians in the dairy of Karsten Thot, located at

Wahiawa, and informing me further that the sale of all dairy products from this dairy as well as the dairy now owned by Kemoo Farm had been prohibited pending my inspection. I also received a communication from Capt. L. E. Case, Hawaiian Department, requesting information relating to the amount of tuberculosis in the dairy herds of this island.

Immediately upon receipt of the above communication, I visited the above mentioned dairies and subjected them to a rigid inspection, being accompanied by Capt. Case and the Assistant Territorial Veterinarian. I found the barns, milk rooms and surrounding yards clean and the sanitary and hygienic conditions in every way satisfactory. In both dairies the cows had the appearance of being well-fed and cared for and in no instance was there any clinical evidence of tuberculosis. The cow, which had died and which was said to have presented lesions of generalized tuberculosis upon post-mortem examination, had been buried and it was not considered feasible at that time to exhumate it.

These findings were then reported by me in person at the Adjutant's office, Post headquarters, Capt. Glud being in charge.

On the following day, July 19, I was called to examine the exhumed carcass of the cow above referred to and the most exhaustive examination possible under the circumstances failed to reveal the slightest evidence of tuberculosis. The autopsy did reveal, however, an extensive pleuro-pneumonia and evidences of septic metritis accompanied by abscess formation in the pelvis. Death was undoubtedly due to an auto intoxication from the absorptions of toxins from the septic uterus and surrounding pelvic organs.

It is inconceivable how a diagnosis of generalized tuberculosis could have been made by a veterinarian at all familiar with the pathological lesions of this disease. No specimens were procured at the original autopsy and our examination failed to find any evidence that the organs of the pelvic cavity had been investigated, yet this animal had been under treatment for retained after-birth followed by a septic metritis.

On July 21 and 24, the two dairies were given the intrapalpebral tuberculin test with the result that out of a total of 148 head not one exhibited the slightest indication of a reaction. Such a result was to be expected as these two dairies had not had a reactor since 1916.

Post Veterinarians Lieuts. Nye, Worthington and Sperry were present during the entire test and at the finish reluctantly admitted themselves satisfied with the results.

Upon the results of our inspection and test the order prohibiting the sale of dairy products from these two dairies was at once rescinded.

#### GLANDERS.

On July 16 my attention was directed to a reported outbreak of glanders at the H. S. P. A. Experiment Station at Waipio. Investigations revealed the following:

The subject was an aged work mule which had been off feed for some time and consequently in a run down condition. An intermittent nasal discharge had been noted and recently an ulcerated condition of the right hind fetlock developed. The man in charge called in Dr. E. L. Nye of Schofield Barracks, who diagnosed the condition as strongly indicating glanders and so reported to Captain Case, who at once reported it to me.

Accompanied by the Assistant Territorial Veterinarian I went at once to Waipio where a rigid physical examination failed to reveal any indications of glanders. The nasal discharge, which at this time was slight, was not at all characteristic and had a very decided odor. There were no ulcers on the nasal septum and no swollen submaxillary glands. The ulcerated condition of the fetlock was due simply to a neglected cut or abrasion. However, the animal was given the intradermal mattein test and upon examination failed to show the slightest reaction.



## HEMORRHAGIC SEPTICEMIA OR SWINE PLAGUE.

On July 21, Laie Plantation reported an outbreak of disease among their hogs. Nine had already died, the remaining ones were sick and showing symptoms strongly indicating swine plague.

Upon arrival I found 15 young hogs exhibiting varying symptoms of swine plague. Two were so far gone that they were unable to rise. They were all given a curative dose of Jensen-Salsbery Mixed Infections Bacterins for Swine and the owner was instructed to give them permanganate of potash in the drinking water and to clean and disinfect the pens.

On July 23, I again examined these hogs and found them in as healthy a condition as one could wish. Full appetites and running around as if they had never been sick. No more deaths had occurred and the outbreak had been brought to an abrupt end.

This was an excellent demonstration of the value of these bacterins for without them every one of those hogs would have died. It also clearly demonstrates the necessity of keeping on hand fresh supplies of bacterins and vaccines for just such emergencies.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, July 31, 1919.

Dr. V. A. Norgaard, Chief, Division of Animal Industry, Board of Commissioners of Agriculture and Forestry, Honolulu.

Dear Sir:—I beg to submit the following report for the month of July:

## TUBERCULOSIS CONTROL.

The following dairy cattle were tested during the past month:

	Tested.	Passed.	Condemned.
C. A. Long .....	17	16	1
S. I. Shaw .....	11	11	0
Francisco Rufino .....	3	3	0
J. H. Cummings .....	10	10	0
A. S. Kenway .....	6	5	1
A. Reinecke .....	5	5	0
V. Souza .....	5	5	0
Girls' Industrial School .....	12	12	0
Louis Deniz .....	25	25	0
C. Ikeda .....	16	16	0
P. Miyakawa .....	12	12	0
Jose Haimen .....	2	2	0
J. D. Souza .....	12	12	0
Farm & Inouye .....	57	57	0
C. A. Long .....	2	2	0
Kemoo Farm .....	109	109	0
Karsten Thot .....	39	39	0
S. Shigamoto .....	6	6	0
H. H. Parker .....	1	0	1
	350	347	3

From the above list it will be seen that a total of 350 head were tested out of which number 347 were passed as free from tuberculosis and 3 condemned and branded. Besides the above testing, 10 head of previously condemned cattle were autopsied at the local abattoirs.

## CONTAGIOUS EPITHELIONIA.

A few outbreaks of this disease of poultry have occurred during the month and about 1500 c.c. of vaccine was made up in the laboratory and distributed amongst various owners.

## IMPORTATION OF LIVE STOCK.

A total of 17 vessels were met and boarded during the month, out of which number the following were found to carry live stock for these islands:

S. S. Lurline, San Francisco—20 horses, T. H. Davies & Co.; 18 crates poultry, various.

S. S. Sachem—15 crates poultry.

S. S. Manoa—11 crates poultry.

S. S. Lurline—20 crates poultry, 1 crate rabbits, Amer. Ry. Express Co.; 1 dog, Amer. Ry. Express Co.; 1 dog, H. A. Clover; 8 mules, City Mill Co.; 2 hogs, E. O. Hall & Son.

S. S. Niagara—1 dog, Miss Taylor.

Respectfully submitted,

LEONARD N. CASE,

Assistant Territorial Veterinarian.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

SEPTEMBER, 1919

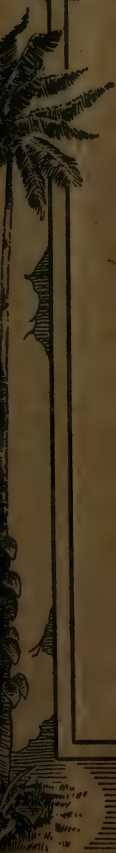
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The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

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All communications in regard to seed or trees should be addressed to David Haugh, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

D. T. FULLAWAY,  
Entomologist.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, SEPTEMBER, 1919.

No. 9

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The Division of Forestry has been fortunate in securing 12 pounds of good koa seed from the Island of Hawaii.

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An illustrated article on the picturesque kukui tree, which is widespread throughout the tropics, is contained in this number.

---

The few fires which have occurred this summer are to be regretted but fortunately they did very little damage to the native forests on watershed areas.

---

Rules for the guidance of the local inspector of the Bureau of Biological Survey in deciding what birds may be admitted into this Territory under federal regulation are printed in this issue.

---

The results of the dressed carcass contests of steers and hogs, held at the Second Territorial Fair in Honolulu, June 9 to 14, 1919, as described by the Assistant Territorial Veterinarian in this number, will be of interest to the stock raisers of the Territory.

---

A supply of the U. S. Department of Agriculture Year Book for 1918 has been received by this Board from Representative Kalaniana'ole and copies may be obtained by addressing The Librarian, P. O. Box 207, Honolulu, or by calling at the Government Nursery, King Street.

---

Special attention is called to the statement of the Forest Nurseryman that the wood of the silk oak, which is commonly planted throughout the Territory, is very suitable for the making of boxes.

---

The work of eradicating bovine tuberculosis, conducted by the Division of Animal Industry, is making good progress and additional financial assistance in the indemnification of owners of condemned animals is expected shortly from the U. S. Department of Agriculture.

## Koa Seed Secured

---

The difficulty of securing good seed of the koa, *Acacia koa*, was somewhat overcome in August when the Superintendent of Forestry made a special investigation of the condition of the seed pods on the trees found on the trail in Kau leading up to Mauna Loa at an elevation of about 5,000 feet. He found a great many of the pods which had not been attacked by the larvae of Tortricid moths and others which were only partly infested. Out of one-third of a bag of pods, one pound of clean seed was secured.

By interesting some of the youths near the Volcano House in the proposition of collecting koa seed and offering \$5.00 per pound for the clean seed it was possible to secure in this manner a supply of twelve pounds of seed. This will be used in the planting operations of the Division of Forestry at the higher elevations in the Territory.

---

## New Fire Wardens Appointed

---

At a meeting of the Board of Agriculture and Forestry held on September 17, 1919, the following new District Fire Wardens were appointed:

Arthur J. Stillman, District Fire Warden in and for that portion of the District of Kona extending from the land of Kahaluu to the Kohala District line, Hawaii, vice John A. Maguire, deceased.

E. K. Duvauchelle, District Fire Warden in and for that portion of the Island of Molokai including and lying to the east of Wailau Valley and the land of Mapulehu, vice C. C. Conradt, moved away.

Ernest Brecht, District Fire Warden in and for that portion of the District of Waianae lying to the west of the Waianae Mountains, Oahu, vice F. Meyer, deceased.

---

## Rules for Bird Importations

---

In the following letter from the Bureau Chief of the Biological Survey at Washington, D. C., to Chief Plant Inspector E. M. Ehrhorn, who has recently been appointed Inspector of Foreign Mammals and Birds under that Bureau at Honolulu, are laid down certain rules under which birds may and may not be admitted to the Territory of Hawaii:

UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF BIOLOGICAL SURVEY  
WASHINGTON, D. C.

August 20, 1919.

Mr. Edward M. Ehrhorn,  
Inspector of Foreign Mammals and Birds,  
Honolulu, Hawaii.

Dear Mr. Ehrhorn:

I need hardly say we greatly appreciate the cordial offer of co-operation contained in your letter of recent date, expressing your willingness to continue the work of inspecting foreign birds and mammals in the port of Honolulu in place of Mr. Daniel B. Langford, who resigned prior to his departure for the Orient.

Your appointment as Inspector under the same conditions as that held by Mr. Langford has been issued and was mailed to you a day or two ago.

In response to your request for explicit instructions as to birds to be admitted, I would like to say:

1. No bird should be permitted to land in Hawaii which is likely to prove injurious to agriculture, whether such bird is to be liberated or to be kept in a cage. There are so many ways in which birds, ostensibly imported for exhibition, may escape or change hands and be liberated by the new owners, that the risk of admission is too great to take in the case of any injurious species.

2. No species of weaver birds (*Ploceidae*) should be admitted under any circumstances. The past experience with *Munia* (rice bird) on the Islands, and the danger of introduction of other species, as for example the so-called Java sparrows (*Padda oryzivora*) or the Madagascar weavers (*Foudia*) are sufficient grounds for the exclusion of any birds of these groups.

3. No species of *Fringillidae* (finches) should be admitted if intended for liberation.

4. No other birds of which there is any doubt should be admitted for liberation. Species apparently harmless concerning which you are in doubt, may be allowed to enter if kept in captivity and with the understanding that they will be destroyed if investigations prove them to be injurious.

5. Pheasants, doves, quail and other game birds may be admitted; also parrots and canaries intended for exhibition and propagation if kept in cages.

Any other points that are not clear to you we should be glad to explain on request.

Very truly yours,

(Signed) E. W. NELSON,  
Chief of Bureau.



## The Kukui or Candlenut Tree

By C. S. JUDD, *Superintendent of Forestry.*

One of the handsomest trees in the Hawaiian Islands is the kukui or candlenut tree, *Aleurites moluccana* (L.) Willd., which belongs to the Euphorbia family and is a native of Malaya and Polynesia. It is now planted in most tropical countries where here and there it has become naturalized. In India it is called the Indian walnut and the Belgaum walnut and in the Philippines it is known as lumbang.

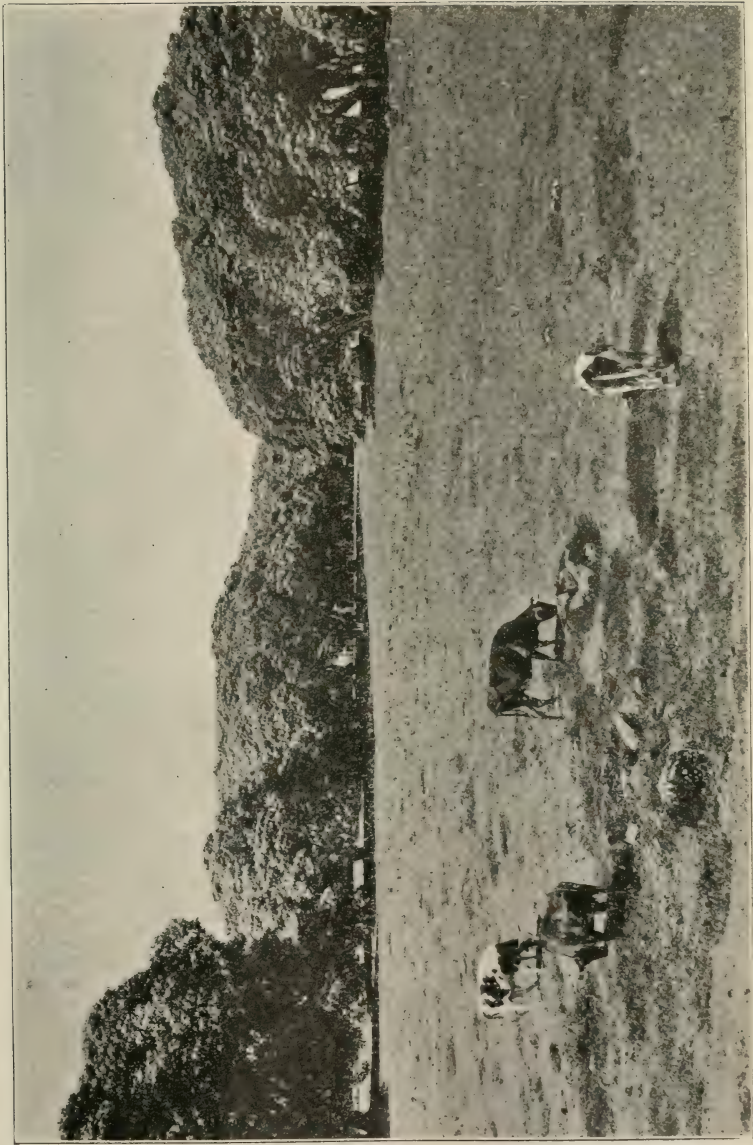
The kukui was probably brought to Hawaii in prehistorical times by the natives when they made their venturesome canoe voyages from "Kahiki," for they depended for their illumination on the oily nuts of this tree and from the juice of the fleshy covering of its green fruit secured the black dye with which they tattooed their skins.

The light, silvery green color of the kukui foliage makes it readily distinguishable in the Hawaiian forest and, from afar, its rounded crowns hugging the mountain slopes or nestled in shallow valleys resemble clusters of lettuce. The kukui prefers the richer soils and for this reason is found mainly on the lower slopes and in valley bottoms. It occurs in the dry as well as the wet regions, however, and is the distinguishing tree in the forest type which is found from approximately 1000 to 2000 feet above sea level. In deep and narrow gulches, where the crown of the tree reaches up to the light, it often attains a height of 80 feet and grows with long and slender boles which for the most part are clear of branches. When grown in the open the kukui is much branched and displays a low, spreading crown with a trunk diameter of several feet.

On flat lands in both the wet and dry region the kukui is often found growing in extensive groves such as the one (shown in the accompanying illustration) at Kilauea, Kauai, under whose pleasing and protective shade the early missionaries used to give religious instructions to the Hawaiians. In dry, shallow, upland gulches one may often travel for miles beneath the cooling shade of tall kukui trees which form such a complete crown canopy that very little, if any, ground cover is found beneath them.

The leaves of the kukui, which seem to be covered with a silvery gray powder, are very variable in shape and may be undivided or 3, 5 to 7 triangularly lobed. On the older trees the leaves are invariably smaller than on young, rapidly-growing saplings. The clusters of creamy white blossoms found at the end of branchlets are extremely attractive.

The fruit is fleshy and contains from 1 to 2 nuts which are rough and furrowed like a walnut and very hard shelled. The



KUKUI GROVE AT KILAUEA, KAUAI



kernel of the nut has an oil content of 65 per cent. which, as a drying oil for paint, is said to be equal to linseed oil. The natives were wont to dry the kernels and stringing them together on the midrib of the coconut leaflet used them for torches or candles. The expressed oil was also burned in stone lamps and was used medicinally as a purgative. The roasted kernel is also pounded and mixed with salt and either Chili pepper or seaweed and forms a brown paste which is very appetizing and much relished by the natives.

In the earlier days, kukui nut oil was exported in quantity from Honolulu with some profit, but more recently several attempts to revive the industry have not met with success, probably on account of the difficulty of securing a sufficient and fairly cheap supply of the nuts. The young trees begin to bear at from 3 to 5 years from planting and produce an annual crop. The fallen nuts will often remain on the ground for 2 years before becoming rancid.

The tree is singularly free from serious insect pests and plant diseases although the wood which is light, soft, and whitish, rots very readily and is not at all durable in the ground. In the Philippines the wood, which has a straight grain and rather coarse texture, is used for wooden shoes and matches. The Hawaiians often used the large straight trunks for dugout canoes but these seldom gave more than 2 or 3 years of service. From the bark of the roots the Hawaiian also derived a dye which was used in coloring canoes black.

The kukui grows readily from the nut which is often washed down the hillsides in large quantities by freshets and sprouts along the water courses. In fact, the most satisfactory manner of establishing the tree is to plant the nut rather than to use transplants. Planting experiments conducted near Honolulu in which the latter have been used have given very poor results for the handling of the young seedling in the nursery seems to stunt it and prevent rapid growth.

---

## The Dressed Carcass Contests Held at the Second Territorial Fair.

---

BY DR. LEONARD N. CASE,

*Assistant Territorial Veterinarian.*

The position occupied by dressed carcass contests in the development of the live stock industry of any country and their educational value to the breeder of meat-producing animals was



dealt with at length in an earlier publication \* and consequently it is unnecessary to enter further into that phase of the subject.

The increasing interest taken in these contests by the live stock breeders of the Territory is indeed encouraging and while the number of contestants at the last fair was small this was due, not to lack of interest, but to faults in the rules and regulations governing these contests which faults will be corrected before the next fair is held. All indications point to a large number of entries and keen competition in this class at the coming Maui County Fair.

#### STEER CONTEST.

Competition in this class was confined to three entries, as follows:

Grove Ranch, 2-year-old grain-fed polled Angus; Haleakala Ranch, 2-year-old grain-fed Hereford, and Mr. H. W. Rice, 14-months'-old grain-fed Hereford.

The judge, Dr. Victor A. Norgaard, awarded the first prize to Grove Ranch. This is the second time this ranch has captured the first prize in these contests.

All these steers were grain-fed and showed high class breeding. On the hoof they showed as well proportioned individuals with great smoothness which last characteristic was beautifully carried through on the killing floor in the case of the Grove Ranch steer and it was principally on the general appearance of the carcass, its smooth covering of fat and the well marbled condition of the meat that this carcass received the first award. As will be seen in the detailed description of the carcasses given below, competition between Grove Ranch and Haleakala Ranch was strong, so strong in fact, that it became necessary to center into the fine points to make the award.

Mr. Rice's entry was clearly out-classed and while an excellent individual with closer balance than the other two, it was too young an animal to compete with them. In the extra ten months necessary to equalize the age a very superior animal could have been developed.

Taking the three carcasses as a whole, they amply demonstrated the results of intelligent breeding and feeding. While all were very evenly balanced, there is room for improvement in that the excess weight should be bred into the hind quarters. To strengthen the loin by forty to fifty pounds would bring about the desired result and add to the value of the carcass. In the case of carcasses Nos. 2 and 3 a smooth covering of fat is to be desired; patchiness in this respect was too much in evidence.

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\* The Hawaiian Forester and Agriculturist, Aug., 1918, Vol. XV, No. 8, p. 251.

## DETAILED DESCRIPTION OF CARCASSES.

## STEER CARCASS NO. 1—FIRST PRIZE.

Owner.....	Grove Ranch
Subject.....	Poll Angus steer
Age.....	2 years
Feeding.....	Grain-fed
Live weight.....	968 lbs.
Dressed.....	607 "
Dressing percentage.....	62.70%
Dressed weight after 58 hrs. chilling.....	591 lbs.
Loss in shrinkage.....	16 "
Percentage loss in shrinkage.....	2.7%

Weight of caul fat.....	31 lbs.
" " tripe.....	33 "
" " liver.....	12 "
" " tongue.....	6 "
" " cheek meat.....	7 "
" " heart.....	5 "
" " green hide.....	66 "
" " tail.....	2 "
" " suet and kidneys.....	18 "
" " hind quarters.....	277 "
" " fore quarters.....	314 "

## Weight of different cuts and percentage of same:

Cuts.	Weight.	Percentage.
Rounds.....	135 lbs.	22.84
Chucks.....	103.5 "	17.51
Loins.....	106.5 "	18.02
Plates.....	82 "	13.87
Cross ribs and shanks.....	63 "	10.66
Ribs.....	64 "	10.83
Flanks.....	37 "	6.26
Skirt steaks.....		
Tail, suet and kidneys....		

## STEER CARCASS NO. 2—SECOND PRIZE.

Owner.....	Haleakala Ranch
Subject.....	Hereford steer.
Age.....	2 years
Feeding.....	Grain-fed
Live weight.....	1013 lbs.
Dressed.....	632 "

Dressing percentage.....	62.38%
Dressed weight after 58 hrs. chilling.....	613 lbs.
Loss in shrinkage.....	19 "
Percentage loss in shrinkage.....	3.09%

Weight of caul fat.....	24	lbs.
" " tripe.....	30	"
" " liver.....	11	"
" " tongue.....	6	"
" " cheek meat.....	7	"
" " heart.....	5	"
" " green hide.....	81	"
" " tail.....	2	"
" " suet and kidneys.....	18.75	"
" " hind quarters.....	291	"
" " fore quarters.....	322	"

Weight of different cuts and percentage of same:

Cuts.	Weight.	Percentage.
Rounds.....	136 lbs.	22.18
Chucks.....	106 "	17.28
Loins.....	130 "	21.20
Plates.....	87 "	14.19
Cross ribs and shanks.....	60 "	9.78
Ribs.....	65.5 "	10.68
Flanks.....	28.5 "	4.65
Skirt steaks.....		
Tail, suet and kidneys....		

#### STEER CARCASS NO. 3—THIRD PRIZE.

Owner.....	H. W. Rice
Subject.....	Hereford steer
Age.....	14 months
Feeding.....	Grain-fed
Live weight.....	829 lbs.
Dressed.....	452 "
Dressing percentage.....	54.52%
Dressed weight after 58 hrs. chilling.....	440 lbs.
Loss in shrinkage.....	12 "
Percentage loss in shrinkage.....	2.72%

Weight of caul fat.....	11	lbs.
" " tripe.....	26	"
" " liver.....	9	"
" " tongue.....	5	"
" " cheek meat.....	6	"

"	"	heart.....	4	"
"	"	green hide.....	63	"
"	"	tail.....	1.25	"
"	"	suet and kidneys.....	9	"
"	"	hind quarters.....	214	"
"	"	fore quarters.....	226	"

Weight of different cuts and percentage of same:

Cuts.	Weight.	Percentage.
Rounds.....	117 lbs.	26.59
Chucks.....	78.5 "	17.84
Loins.....	83.6 "	19.00
Plates.....	53 "	12.04
Cross ribs and shanks.....	46.5 "	10.57
Ribs.....	43 "	9.77
Flanks.....	18.4 "	4.18
Skirt steaks.....		
Tail, suet and kidneys....		

### SWINE CONTEST.

Competition in this class was narrowed down to a single exhibitor, Molokai Ranch, which entered three well finished Duroc-Jersey hogs, all grain-fed and showing excellent breeding. They were as even a bunch of hogs as could be well imagined and little or no difference could be seen in the dressed and chilled carcasses. It was only when the dressing percentage and the weights and percentages of the different cuts were obtained that any difference could be detected and it was upon these differences that the awards were based.

The detailed description of these entries are given below:

#### HOG CARCASS NO. 1—FIRST PRIZE.

Owner.....	Molokai Ranch
Subject.....	Duroc-Jersey barrow
Age.....	6 to 7 months
Feeding.....	Grain-fed
Live weight.....	225 lbs.
Dressed.....	190 "
Dressing percentage.....	84.4%
Weight after 58 hrs. chilling.....	184 lbs.
Loss in shrinkage.....	6 "
Percentage loss in chilling.....	3.26%



## Weight of the different cuts and percentage of same:

Cuts.	Weight.	Percentage.
Hams.....	38 lbs.	20.65
Loins.....	50 "	27.12
Bellies.....	23 "	12.50
Shoulders.....	20.5 "	11.14
Head.....	18 "	9.78
Spare rib.....	4.5 "	2.44
Leaf lard.....	10 "	5.43
Back fat.....	15.5 "	8.42
Feet.....	2.75 "	

## HOG CARCASS NO. 2—SECOND PRIZE.

Owner.....	Molokai Ranch
Subject.....	Duroc-Jersey sow
Age.....	6 to 7 months
Feeding.....	Grain-fed
Live weight.....	235 lbs.
Dressed.....	191 "
Dressing percentage.....	81.2%
Weight after 58 hrs. chilling.....	184 lbs.
Loss in shrinkage.....	7 "
Percentage loss in chilling.....	3.80%

## Weight of the different cuts and percentage of same:

Cuts.	Weight.	Percentage.
Hams.....	36 lbs.	19.58
Loins.....	51 "	27.71
Bellies.....	23 "	11.95
Shoulders.....	17.75 "	9.66
Head.....	21 "	11.41
Spare rib.....	4 "	2.17
Leaf lard.....	9 "	4.837
Back fat.....	17.5 "	9.51
Feet.....	3 "	

## HOG CARCASS NO. 3—THIRD PRIZE.

Owner.....	Molokai Ranch
Subject.....	Duroc-Jersey sow
Age.....	6 to 7 months
Feeding.....	Grain-fed
Live weight.....	245 lbs.
Dressed.....	192 "
Dressing percentage.....	78.3%

Weight after 58 hrs. chilling.....186 lbs.  
 Loss in shrinkage..... 6 "  
 Percentage loss in chilling.....3.22%

Weight of the different cuts and percentage of same:

Cuts.	Weight.	Percentage.
Hams.....	42 lbs.	22.58
Loins.....	49 "	26.34
Bellies.....	25 "	13.44
Shoulders.....	16.5 "	8.33
Head.....	18 "	9.67
Spare rib.....	4.25 "	2.28
Leaf lard.....	6.5 "	3.49
Back fat.....	20 "	10.75
Feet.....	2.5 "	

## Division of Forestry

Honolulu, Hawaii, September 6, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of August, 1919:

### TREE PLANTING.

Owing to dry conditions on the planting areas, the number of trees planted out on forest reserves was restricted to 287 yellow poinciana and 564 red gum trees which were set out at Mikilua within the Lualualei Forest Reserve on Oahu.

Several redwood (*Sequoia sempervirens*) and Benguet pine (*Pinus insularis*) trees were planted on August 4, at the Upper Olaa Ranger Station, Hawaii, in order to test their adaptability to this region.

### FOREST FENCING.

At 24 miles on the Volcano Road in Olaa, Hawaii, a stretch of fence .19 mile long was completed on a part of the boundary of the new Olaa Forest Reserve in order to continue the protection afforded by an adjacent older fence and prevent dairy cattle, wandering along the road, from getting into the tree fern and ohia forest which is very attractive at this point.

### FOREST FIRE.

Ranger Hardy reports the occurrence of two small fires in the Kokee region on Kauai during August, probably started by careless smokers. One on the Mohihi-Koaie divide, covered two-thirds of an acre and no trees of value were destroyed. It was subdued in three hours, but

continued to break out again until the fifth day when a trench was dug around the entire area which was effective in extinguishing it. The other fire was in the Nawaimaka Valley and was put out promptly after about one acre of grass had been burned over.

The largest fire which has occurred for some time was started, presumably by pig hunters, on July 6, and burned over approximately 5,500 acres of open grass pasture and scattered koa and mamani trees on the lands of Kaohe and Kaholalele between the 5000 and 7000 feet elevation on the north slope of Mauna Kea in Hamakua, Hawaii. District Fire Warden D. S. Macalister of the Kukaiau Ranch discovered the fire on July 7, and with the aid of his cowboys soon got it under control, but it kept breaking out again on account of dry conditions and a strong wind until July 26 when it spread to the Parker Ranch paddocks. With combined assistance from both ranches, the burning area was trenched and patrolled and put into a condition which would prevent it from spreading any further. It will probably not be completely extinguished until the heavy rains fall.

#### INSTRUCTION AT TERRITORIAL SCHOOL.

From August 1 to 18, I was engaged in delivering lectures on forestry at the Territorial Summer School in camp at Kilauea, Hawaii. These covered two courses, one in "Elementary Forestry" and the other in "The Hawaiian Forests" and seemed to be much appreciated.

#### HAWAII TRIP.

The balance of the month was spent on Hawaii engaged in a great many matters which required attention such as, cutting of dangerous dead trees along the new concrete Volcano Road in the Panaewa Forest Reserve, four miles out from Hilo; inspection of the Hilo sub-nursery; inspection of new fences and arranging for the construction of others; investigating and conferring with many parties on the adjustment of forest boundaries where either agricultural land should be eliminated or the forest boundary extended so as to include additional forest land; particularly on the lower line of the Hilo Forest Reserve; inspecting new forest reserve areas and arranging for the elimination of wild stock; collecting koa and other seed and arranging for the securing of additional amounts; giving cooperative advice on forest planting and securing recommendations concerning eligibles for appointment as forest rangers and fire wardens. In addition to this, I spent from August 23 to 26 in Kona inspecting the Waiaha Spring and Honuaula Forest Reserves and returned to Honolulu on September 1. Action required on many of the above subjects will be presented to you shortly for consideration by special reports.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

#### REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, September 6, 1919.

Superintendent of Forestry, Honolulu, T. H.

Dear Sir:—I herewith submit a report of the principal work done during the month of August:

## NURSERY.

## Distribution of Plants:

Sold 100 in transplant boxes and 167 pot grown, making a total of .....	267
Gratis, including forest reserves and Government institutions—	
In seed boxes .....	2,500
In transplant boxes .....	150
Pot grown .....	589
Total .....	3,506

## COLLECTIONS.

Collections on account plants sold.....	\$ 3.80
Rent of office, Nursery grounds, July.....	35.00
Total .....	\$ 38.00

## PLANTATION COMPANIES AND OTHER CORPORATIONS.

During the month 5,000 transplants in boxes and 2,200 pot grown plants were distributed.

## MAKIKI STATION.

The work done at this station in addition to the regular routine has been cutting up wood for boxes, fence posts, etc. It might be interesting to the corporations who import box shooks by the thousands to know that the *Grevillea robusta* (silk oak) makes splendid boxes, the best in fact that we have come across amongst the island grown species. The *Araucaria Bidwillii* comes next to the silk oak, a very good box wood also, but generally more knotty and not so clean as the former. The silk oak is a fairly fast growing tree and could be used for box making when it reaches sufficient size, the young wood being just as good as the old for making box shooks. The different species of *Araucaria* are also fairly fast growing and might be considered for box making should the pineapple interests think it worth while to grow their own box wood.

## HONOLULU WATERSHED PLANTING.

The work done on the Honolulu watershed has been clearing away grass and weeds from the young trees, clearing trails, etc.

## ADVICE AND ASSISTANCE.

The writer has been called to visit and otherwise give advice and assistance as follows: Visits made 6; advice by telephone 8; advice to people calling 6; advice by letter 3.

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.



# Division of Entomology

Honolulu, Hawaii, Sept. 2, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—During the month of August the insectary handled 21,800 pupae of the melon fly, from which there were bred 4,427 females and 3,905 males, *Opius fletcheri*.

The distribution of parasites was as follows:

## MELON FLY PARASITE.

### *Opius fletcheri*.

Oahu:	Females.	Males.
Kailua .....	1800	1950
Moiiliili .....	1370	1375
Alewa Heights .....	100	100
Woodlawn .....	130	140
Hawaii:		
Kamuela .....	500	500

## FRUIT FLY PARASITES.

### *Diachasma tryoni*.

Oahu:		
Kalihi .....	1000	950

### *Tetrastichus giffardianus*.

Oahu:		
Kalihi .....		2050

### *Opius humilis*.

Oahu:		
Kalihi .....	450	430

### *Galesus silvestri*.

Oahu:		
Nuuanu .....		1000

### *Diachasma fullawayi*.

Oahu:		
Kalihi .....		50

### *Dirhinus giffardi*.

Oahu:		
Nuuanu .....		400

Respectfully submitted,

D. T. FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, August 31, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—I respectfully submit my report of the work carried on by the Division of Plant Inspection for the month of August, 1919, as follows:

During the month 51 vessels arrived at the port of Honolulu, 21 of which carried vegetable matter and 5 vessels came through the Panama Canal Zone. The following disposed was made of the various shipments:

Passed as free from pests..	642 lots	17,748 packages
Burned.....	63 “	63 “
Fumigated.....	1 “	1 “
Returned.....	16 “	16 “
Total inspected.....	722 “	17,828 “

Of these shipments 17,569 packages arrived as freight, 68 packages as mail and 191 packages as baggage.

### RICE AND BEAN SHIPMENTS.

During the month 18,250 bags of rice, including 30 bags from Hong-kong, China, and 1730 bags of beans arrived from Japan and were found free from dangerous insect pests.

### PESTS INTERCEPTED.

Approximately 4619 pieces of baggage belonging to immigrants from foreign countries were examined, from which 9 lots of fruit and 39 lots of vegetables were taken and destroyed.

On August 7, 4 ornamental plants found in the baggage of a passenger from Manila were returned, being prohibited.

On August 9, 1 *Thuja orientalis* was refused landing.

On August 12, 10 lychee trees found in the baggage of an immigrant from China were burned.

On August 19, 1 cocoanut trunk from Samoa was destroyed.

On August 26, a package of cucumber seeds found in the mail from Japan infested with Lepidopterous larvae was fumigated with carbon bisulphide.

On August 26, 10 boxes of crabapples from San Francisco, found infested with the codling moth, were returned to the shipper.

On August 29, 2 cocoanut plants and one “Purse” of land crab were seized from a Japanese from Fanning Island and destroyed.

### HILO INSPECTION.

Brother M. Newell, Inspector of Hilo, reports the arrival of 7 vessels at the port of Hilo, 2 steamers carrying vegetable matter. There were 124 lots and 1439 packages of fruits, vegetables, plants and seeds which were passed as free from pests. From Japan 5702 bags of rice, 360 bags of beans, 15 bags of peanuts and 11 packages of vegetable seeds were passed, all clean.

## KAHULUI INSPECTION.

Mr. Edwin C. Moore, Acting Inspector at Kahului, reports the arrival of eight vessels at the port of Kahului, one of which carried fresh fruit and vegetables consisting of 9 lots and 457 packages, all being free from pests, excepting four boxes of pears which were in a badly rotted condition, insects being present in the rotted mass. These were destroyed.

## INTER-ISLAND INSPECTION.

Fifty-six steamers plying between Honolulu and other Island ports were attended and the following shipments passed as free from pests:

Taro .....	631	packages	
Fruit .....	153	"	
Plants .....	2687	"	(of which 2615 were pineapple suckers)
Vegetables .....	422	"	
Seeds .....	16	"	

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Total passed .... 3909 "

Sugar cane (H. S. P. A.)—176 cases.

Four packages of plants were refused shipment on account of infestation, undesirable soil or not complying with the regulations.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry

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Honolulu, Hawaii, Sept. 9, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I beg to submit herewith my report on the work of the Division of Animal Industry for month of August, 1919.

### TUBERCULOSIS CONTROL.

From the appended report of the Assistant Territorial Veterinarian, it will be seen that during the months of July and August, 41 dairies containing a total of 1297 animals were submitted to the tuberculin test. Of this number 31 dairies were found to be free of tuberculosis, while the remaining 10 dairies were found to contain not less than 99 reactors. This very high percentage is due to the fact that the Waialae Ranch of 435 head of cattle contained not less than 85 reactors. This dairy last year had only 37 reactors, while the year before it contained 104 reactors. It was therefore fully expected that last year's record would have been considerably reduced, instead of which it was found to be tripled. The reason for this great increase has not yet been ascertained, but every effort will be made to find the possible cause.

With the Waialae Ranch eliminated, the percentage of reactors of the 41 dairies would have been less than one, whereas it is now nearly ten.

On the other hand, it is a pleasure to report that information has been received from the Chief of the Federal Bureau of Animal Industry to

the effect that the Territory will be admitted to the benefits of the tuberculosis eradication efforts of the U. S. Department of Agriculture. Under date of July 19, the Chief of the Bureau of Animal Industry writes as follows:

"I take pleasure in acknowledging receipt of your letter of June 21, transmitting copy of your report addressed to the Board of Commissioners of Agriculture and Forestry, Honolulu, Hawaii, respecting the work of the Division of Animal Industry for the month of April, 1919; also, copy of Act No. 204, 'To Prevent, Suppress and Eradicate Bovine Tuberculosis and to Provide for the Indemnification of Owners of Cattle Destroyed Under the Provisions of Same.'" After reviewing both of the above mentioned papers I see no reasons why, after the passage and approval of the Agricultural Appropriation Bill, the Bureau cannot cooperate with the Hawaiian Territory in tuberculosis eradication work.

" \* \* \* \* As soon as the Agricultural Bill is enacted into a law and is approved by the President, you will be notified and it will be satisfactory to proceed with the work from the date of the approval of the bill."

From this it will be seen that in case the federal Agricultural Appropriation Bill has been passed, the Territory will be benefited to the extent of about \$2,000.00 in the indemnification for tuberculous cattle for the past month alone.

At the present writing it has not been possible to ascertain whether the bill in question was passed prior to the testing of the Waialae Ranch, but there is every reason to believe that such is the case.

From the Island of Kauai, the Deputy Territorial Veterinarian reports having tested all dairy cattle from Wainiha to Kealia. That part of the country seems to be practically free from tuberculosis as only one reactor was found.

The Deputy on Maui likewise reports having tested nearly two thousand head of cattle and found only six reactors. This, in conjunction with the previous report of the Deputy on Hawaii, would seem to indicate that the disease is far less prevalent on the other islands than is the case on Oahu.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

#### REPORT OF THE ASSISTANT VETERINARIAN.

Honolulu, Hawaii, Sept. 4, 1919.

Dr. V. A. Norgaard, Chief, Division of Animal Industry, Board of Commissioners of Agriculture and Forestry, Honolulu.

Dear Sir:—I beg to submit the following report for the month of August, 1919:



## TUBERCULOSIS CONTROL.

The following dairy cattle were tested during the past month:

	Tested.	Passed.	Condemned.
Leahi Home .....	15	15	0
Frank Andrade .....	56	53	3
K. Mitsunago .....	7	7	0
Oahu College .....	20	20	0
College of Hawaii.....	22	22	0
Mid-Pacific Institute .....	19	19	0
Salvation Army Home .....	10	10	0
Castle Home .....	5	5	0
J. Yamane .....	1	1	0
C. H. Bellina .....	116	115	1
C. W. Lucas .....	34	34	0
Chas. Lucas .....	5	5	0
Lunalilo Home .....	22	22	0
J. Monte .....	12	11	1
M. Quintal .....	11	10	1
M. Medeiros .....	2	2	0
M. Calistro .....	16	15	1
Vincent Souza .....	7	7	0
S. Tsumoto .....	11	11	0
Chas. Lucas .....	120	116	4
Chas. Costa .....	1	1	0
Waialae Ranch .....	435	350	85
	947	851	96

From the above list it will be seen that a total of 947 head were tested out of which number 851 were passed and 96 condemned and branded.

Besides the above work, autopsies were performed on 12 head of condemned cattle and lesions of tuberculosis found in each case. Two were so extensively affected that the carcasses were condemned entirely.

## CONTAGIOUS EPITHELIONIA.

A few outbreaks of sore-head among poultry have occurred during the past month. In each case owners have been supplied with the necessary vaccine.

## IMPORTATION OF LIVE STOCK.

During the month 33 vessels have been met and boarded, among which the following were found to carry live stock destined for the Territory: S. S. Schem, San Francisco—1 horse, J. O'Rourke; 1 bull dog, C. J. Blachly; 1 parrot, Amer. Ry. Ex. Co.; 8 crates poultry, J. C. Rued; 5 crates poultry, Wo Chung.

S. S. Manoa, San Francisco—18 crates poultry.

S. S. Meridan, Seattle—2 dogs, Newton S. Kam.

S. S. Lurline, San Francisco—2 boxes rabbits, Amer. Ry. Ex. Co.; 2 crates poultry, C. G. Petersen; 79 crates poultry, Kemoo Farm; 1 Boston bull dog, Mrs. Orrin Backus.

Respectfully submitted,

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

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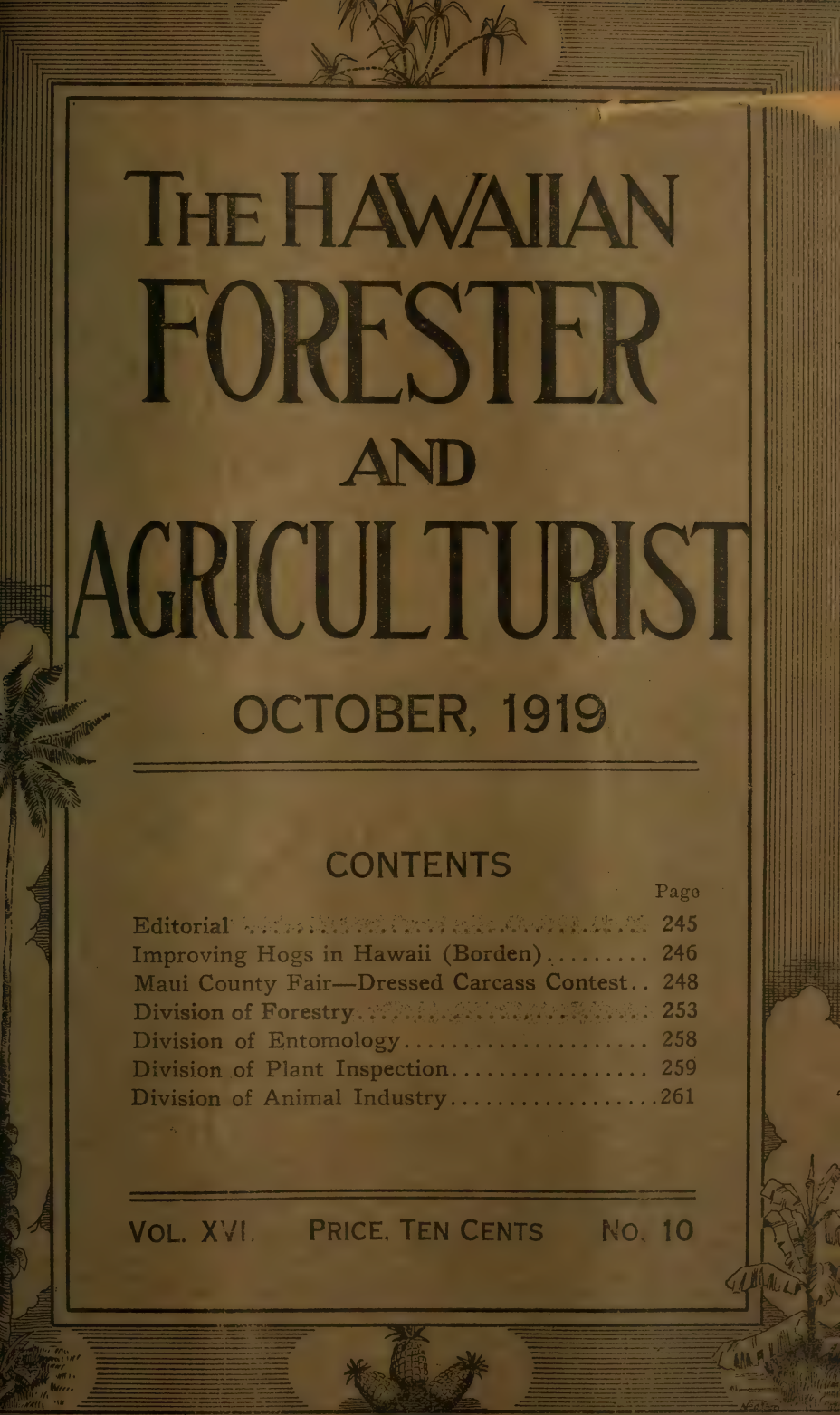
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

OCTOBER, 1919

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, OCTOBER, 1919.

NO. 10

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The Territorial Veterinarian's article on the results of the dressed carcass contests at the recent Maui County Fair held in Kahului on Oct. 9 to 11, 1919, should be of special interest to ranchers who are raising grain fed stock.

Charles E. Stone, of Woods Valley, Kau, Hawaii, was recently appointed Forest Ranger for Kau and South Kona, Hawaii, and began his duties on October 6. Mr. Stone's chief work will consist of protecting the forest reserves from damage, mainly by seeing that the boundary fences are kept in good repair and are effective in keeping stock away from the important watershed forests in his district.

It is hoped that the prompt measures taken to control the Australian fern weevil infestation at 29 Miles, Oloa, Hawaii, will result in the complete suppression of this insect pest in this new locality.

As will be seen in the current report of the Superintendent of Forestry, the work of protecting forest boundaries by fencing and the elimination of wild stock from the forest reserves is progressing.

During the month of September the Entomologist distributed a total of 16,600 parasites on the melon fly and fruit fly from propagations made at the government insectary.

The Territory would be much benefited if the advice given by Prof. Borden in his article on improving hogs were followed out by those who as yet have taken no steps along these lines.

After a public hearing at which objections were voiced against the proposition of taking black sand in large quantities from the bank above Makiki Drive in the Honolulu Watershed Forest Reserve, the Board declined to grant permission for such removal.

The Superintendent of Forestry and Forest Nurseryman have started the soldiers in the forestry course of the vocational school at Schofield Barracks by having them collect and sow the seed

for the growing of 20,000 tree seedlings. The course at present is confined to three trees—the ironwood, swamp mahogany, and koa—and it is certain that the men will know a great deal about these trees when the school term is ended.

## IMPROVING HOGS IN HAWAII

By Ralph J. Borden.

Traveling about the country districts and even through those more thickly populated sections where hogs are being raised, one is impressed by the "scrubby" appearance of the greater majority of hogs he sees. Why is this so? Why do so many of these hogs "simply exist" when a little care and feeding might turn them into a profitable investment? Among such a varied population as ours is, there are large quantities of pork and pork products consumed and yet most of these are brought into the Islands from outside. Why not raise more pork here, by improving what hogs we have and increasing our herds?

The typical "scrub" hog which is so prevalent is long of legs, neck and snout, has a narrow back, small thin hams, very little spring of ribs and is spare in flesh. She will eat ravenously and develop a large belly, but will not put much meat on her body. Her development is slow and when fattened she puts most of her fat around the digestive organs. This scrub hog is the product of poor feed and care, close inbreeding, uncontrolled mating or allowing hogs of all ages, sizes, sexes and breeds to run together. She will eat the same food which a superior individual would make better use of, is just as expensive to keep, and costs even more to raise because of her slow development and the fact that when she is grown she will not return as large a percentage of edible products. Being left to herself, she either produces progeny which resemble her and have her breed characteristics or gives birth to a degenerate type even worse than herself, being forced, as she is, to forage for most of her food, she develops a strong constitution and is vigorous, healthy and prolific. These qualities are admirable and worthy of being saved.

The primary factor in the improvement of these scrub hogs is to eliminate the scrub boar and use nothing but purebred boars. Boars of improved breeding are not expensive when one realizes what they will do to pigs sired by them. Scrub boars or cross-bred boars cannot be depended upon as breeders. Their progeny are sure to be inferior in form and quality. Purebred boars are prepotent; that is, because they are the product of a long line of ancestry that have been bred true to breed type, they transmit their breed characteristics and their individual type to their offspring. When mated with scrub sows, the resultant litters will take on more of the characteristics of the boar because of this

prepotency which is lacking in the scrubs or grades. Hence, there is an improvement which is very soon evident.

In the selection of a boar of any breed, it is best personally to pick him out. Look at the registration papers of his sire and dam and then at those individuals themselves. See some of his litter mates. Inquire into the litter record of his dam. Then look at the individual himself. He must be masculine, active, compact, large for his age and possess those qualities (deep, wide chest; broad, arched back; deep body, short neck, short legs, big bone, large, strong hams, etc.) which go with perfect individuality. See that he is strong in those points where the sows are weak, for the mating of animals with common weaknesses tends to accentuate this weakness in the offspring.

The next step is to control the matings. The boar should not be allowed to run with the sows, or he will breed young sows at too early an age, breed mature sows too soon after farrowing and waste his vitality with too frequent service. Then again it is well to know when a sow is served so that an attendant may be on hand to assist her when her young are due to arrive. This attendance will save many pigs which otherwise are killed soon after their birth.

After the sow is bred she should be properly fed and cared for so that she will have plenty of milk for her family when it arrives. She will not be able to do this well if she has had to find all of her living. A little extra food at the time will more than pay for itself when the pigs come.

At farrowing time, reduce the feed and, for 48 hours after farrowing, give the sow nothing but water. This will prevent udder troubles and sickness among the young pigs. Later the sow must be brought gradually to her full feed, taking 10 to 14 days before she is getting all she wants.

If the sow is properly fed and the young pigs given shade, exercise, clean water and sanitary quarters they will grow and thrive on the sow's milk until four weeks old. Then they will want additional food and will eat with their dam. At this time a growing food rather than a fattening food is essential, for we want size in a hog before we begin to fatten it. The young pig must now be kept growing or it, too, will fall back again into the scrub hog class.

In conclusion, it may be added that there is no excuse for the man whose place today is overrun with scrub hogs. Good boars are not expensive and the prices paid for market pork easily warrant the outlay of some money for proper feed. There is plenty of work to be done in grading up scrub herds of hogs, but each hog raiser who enters upon this work, and considers each hog as an investment capable of paying yearly dividends instead of merely a possession, will find himself on the road to success and will not only benefit himself and fellow hog raisers, but the pork eaters of our Islands as well.



# MAUI COUNTY FAIR, 1919

## DRESSED CARCASS CONTEST.

J. C. Fitzgerald, Superintendent of Contest.

Victor A. Norgaard, Judge of Contest.

At the Second Maui County Fair held at Kahului, Maui, Oct 9-11, 1919, there were entered in the Dressed Carcass Contest three pens of steers, three animals to each pen. Two of the exhibits consisted of high grade Hereford steers, while the third were Polled Angus steers nearly if not quite pure bred.

All the animals were stall-fed and all were well finished, the two pens as fat steers and the third as baby beef.

The Hereford and Angus steers were practically of the same age, 2 years and 10 months, while the baby beef Herefords were only 1 year and 3 months old.

On October 18, the respective exhibitors each selected one animal from the competing pens, for the final test of their merits as beef cattle. These animals were taken to the Puunene slaughter house where they were butchered and dressed under the direct supervision of Mr. Angus McPhee. The carcasses, quartered and plainly marked, were taken to the Puunene Meat Market, where they were to be chilled for 48 hours, as required by the regulations of the contest.

In this connection it should be mentioned that owing to some misunderstanding the temperature of the refrigerator was not kept sufficiently low to insure proper chilling, for which reason the figures pertaining to loss in weight and shrinkage percentage are of doubtful values. This, however, does not perceptibly affect the subsequent weight percentages of the cuts as the total shrinkage on the largest carcass amounted to only 16 pounds, or less than 2%.

On October 20, when the carcasses were to be cut and judged, the superintendent of the contest handed the judge the official slaughter house weights, consisting of the live weight and dressed weight of each steer, and the weights of the green hides and of the trimmings. All subsequent weights and percentages were based on the chilled carcass weights.

The services of an expert butcher from the Metropolitan Meat Market in Honolulu had been secured to break up the carcasses. On Maui, a side of beef is generally halved into quarters by cutting between the third and fourth posterior ribs. This leaves three ribs on the hind-quarter and naturally makes it heavier in proportion to the fore-quarter, than is generally the case. The method is known as the "New Zealand cut." In the United States only one rib is left on the hind-quarter, which is sufficient to support the flank and protect the kidney suet. As the two previous carcass contests held here have been based on this

method, known as the "Chicago" or "Straight cut," the latter was adhered to; also because otherwise no comparisons would have been possible between the cuts and percentages of this contest with those of the previous ones.

The three carcasses were marked respectively No. 0, No. 7, and No. 4, the first two being the steers and the last the baby beef..

TABLE I.

	Steer No. 0	Steer No. 7.	Steer No. 4.
Owner:	Grove Ranch	Haleakala Ranch	H. W. Rice
Breed:	Grade Angus	Grade Hereford	Grade Hereford
Age:	2 yrs. 10 mos.	2 yrs. 10 mos.	1 yr. 3 mos.
Feeding:	Stall fed	Stall fed	Stall fed
Live weight:	1185 lbs.	1222½ lbs.	980 lbs.
Dressed weight:	766½ lbs.	788 lbs.	563½ lbs.
Dressing percentage:	64.68%	64.46%	57.5%
Chilled weight:	755 lbs.	772½ lbs.	553½ lbs.
Loss in chilling:	11½ lbs. 1.7%	16 lbs., 2.0%	10 lbs., 1.8%
Green hide:	79 lbs.	76 lbs.	88 lbs.

The above figures need little elucidation. The Angus steer (No. 0) and the Hereford steer (No. 7) were of the same age, the difference in live weight being proportional to the difference in size of the two breeds. In so far as the baby beef is concerned, it is hard to draw any comparisons.

The dressing percentage of the two steers is good, well above 64% and slightly in favor of the Angus (No. 0). The dressing percentage of the yearling 57.5%, while good, would indicate that feeding should have been continued for three or four months longer. As an experienced Illinois feeder and exhibitor of market-topping baby beeves says (see *Breeders' Gazette*, Oct. 2nd, 1919, p. 657)—"I have never been able to make a prime yearling within twelve months after weaning time;" whereas, this yearling, according to the exhibitor, was fed for ten months only. During this period it gained nearly two pounds per day.

The ration consisted of a mixture of corn, barley and bran averaging 8 pounds per day, with 10 pounds of alfalfa hay. The cost was about \$96.00 for grain and \$30.00 for hay, making the gain cost an average of 23c per pound. These figures are mentioned only to illustrate that, with the present prices of feed, it cannot possibly pay to produce high class stall fed beef if the feeder is to receive only 16 to 18 cents per pound dressed weight, and the consumer be allowed to buy the prime cuts for 25 to 35 cents per pound. Take as a comparison the carload of baby beef steers (Angus yearlings) sold on the Chicago market, as reported and illustrated in the *Breeders' Gazette* of October 2nd, for \$18.00 per cwt., on the *hoof*. These yearlings averaged only 851 pounds—as compared to the 980 pounds of this Hereford yearling, still they brought the feeder (E. P. Hall, the same quoted above) \$153.18 per head, while our yearling would have

brought \$101.34 in Honolulu at 18c *dressed weight*, or \$91.28 on Maui at 16c.

The same applies to the steers. The Hereford steer (No. 7) weighed 690 pounds when put on feed at 22 months old. He was fed for 303 days during which time he gained 532 pounds, or 1.75 pounds per day. The daily ration consisted of from 12 to 15 pounds of rolled barley, cracked corn, bran, alfalfa meal and molasses, a little linseed meal and, for roughage, Rhodes grass hay, alfalfa and pasture. The cost of the grain was \$143.40 and the roughage probably \$40.00. The initial cost of the animal was about \$52.00, or a total invested of \$235.00. The carcass of this steer, prime in every respect, dressing nearly 65%, would have brought its owner at the top Honolulu price \$141.84. On the Chicago market it would, on the same date, have brought \$220.00. Is it necessary to say that the exhibitors in the dressed carcass contest entered the same for anything but gain?

The weights of the green hides remain, unless some mistake has occurred, a mystery. the hide of the Hereford yearling weighing 12 pounds more than that of the Hereford steer, nearly 3 years old.

TABLE II.

## BLOCK WEIGHTS AND PERCENTAGES.

	Steer No. 0	Steer No. 7	Steer No. 4
Hind quarters . . . .	363 lbs. 48.1%	366 $\frac{1}{4}$ lbs. 47.4%	262 $\frac{1}{4}$ lbs. 47.4%
Fore quarters . . . .	392 lbs. 51.9%	406 $\frac{1}{4}$ lbs. 52.6%	291 $\frac{1}{4}$ lbs. 52.6%

These weights and percentages indicate that the Angus had a better balanced carcass than the Herefords. The difference may seem small, but it is far from insignificant.

TABLE III.

## TRIMMINGS.

	Steer No. 0	Steer No. 7	Steer No. 4
Tripe . . . . .	36 lbs.	33 $\frac{1}{2}$ lbs	26 lbs.
Liver . . . . .	12 lbs.	12 lbs.	9 lbs.
Tongue . . . . .	5 lbs.	5 $\frac{1}{2}$ lbs.	4 $\frac{1}{2}$ lbs.
Cheek meat . . . . .	5 lbs.	5 lbs.	4 lbs.
Heart . . . . .	5 lbs.	5 lbs.	4 lbs.
Tail . . . . .	3 $\frac{1}{2}$ lbs.	3 $\frac{1}{2}$ lbs.	3 $\frac{1}{4}$ lbs.
Suet and kidneys . . . . .	24 $\frac{1}{4}$ lbs.	26 $\frac{1}{2}$ lbs.	16 $\frac{1}{2}$ lbs.
Caul fat . . . . .	13 lbs.	21 lbs.	7 $\frac{1}{2}$ lbs.

It was recently asserted before the congressional commission investigating the so-called "beef trust" that the wholesale butchers, the "packers," sell the dressed carcass at cost or less than they pay for the cattle on the hoof, say 18 cents per pound—and take their profits out of the trimmings and the hide. The trimmings are therefore of immense importance, to the wholesalers

at least, and many and varied industries have been built up around them of recent years. We are, however, here considering the dressed carcass and will leave it to those interested to figure out the value of the above trimming. The suet and caul fat only is of interest to us in that it indicates a better distribution of fat in the Angus steer than in the Hereford. This is, however, a well established fact and one out of which the Angus breeders take considerable comfort when discussing the merits of their favorites with the Hereford fanciers.

TABLE IV.  
CUTS AND PERCENTAGES.

	Steer No. 0.	Steer No. 7.	Steer No. 4.
Loins .....	176¾ lbs. 23.4 %	167¼ lbs. 21.12%	116½ lbs. 23.2%
Ribs .....	78¼ lbs. 10.25%	91¼ lbs. 11.82%	62 lbs. 11 %
Rounds .....	162 lbs. 21.2 %	172 lbs. 21.8 %	129 lbs. 22.9%
Chucks .....	152 lbs. 19.84%	154 lbs. 19.54%	111 lbs. 19.7%
Plates .....	100 lbs. 13.15%	99 lbs. 12.56%	67¼ lbs. 11.9%
Cross ribs and shanks ....	61½ lbs. 8.0 %	62 lbs. 7.9 %	51 lbs. 9.1%
Suet and kidneys.	24½ lbs. 3.16%	26½ lbs. 3.36%	16½ lbs. 2.9%

In Farmers' Bulletin No. 435 issued by the U. S. Department of Agriculture in March, 1911, the percentages of the various beef cuts to the carcass weight are given as follows:

Cuts.	Loins.	Ribs.	Rounds.	Chucks.	Plates.	Flanks.	Shanks.	Suet.
Extreme ...	15-19	8-11	20-26	21-27	12-16	2-5	3-7	2-7
Average ....	17	9	23	26	13	4	4	4

The Breeders' Gazette early in 1917 gives the following:

Cuts.	Loins.	Ribs.	Rounds.	Chucks.	Plates.	Flanks.	Shanks.	Suet.
Per cent ....	18	10	22	24	14	2	4	3.5

A comparison of these figures with those in Table IV show discrepancies of importance only in the loins and chucks. In both cases the differences are due to the manner of cutting. The heavier loins in the three steers under consideration are due to heavier sirloin butts, which in their turn make the rounds lighter. The chucks on the other hand appear much lighter in our three steers than in the above scales (19.7% to 25%).

This discrepancy can be due either to the amount of neck left on the chuck or to the relative depth of the same. In either case it makes little difference in so far as the judging of the cuts before us is concerned. The chucks are all cut alike, the percentages ranging between 19.54 in the Hereford steer to 19.84 in the Angus, with the yearling at 19.70. If the neck, or part of it, was left with the head as "trimmings" it applies equally to the three. Each chuck contained the anterior five ribs, while the cut known as "ribs" contained seven ribs, leaving one for the "loins."



In considering the percentage of the cuts as shown in Table IV the very heavy loins of the Angus steer (No. 0) and the yearling (No. 4) at once assert themselves, 23.4% and 23.2% respectively. The Hereford steer is fully 2% below either. This, in so far as the steers are concerned, is again a characteristic of the Angus, the heavy loin. That the loin percentage of the Hereford yearling practically equals that of the mature Angus is one of the features of baby beef which has brought this class of beef so prominently to the fore of recent years and which undoubtedly will keep it there for good.

This point is emphasized if we consider the next two valuable cuts, the ribs and rounds, with the loins. The percentages of these three cuts aggregate for the Angus steer 54.85, for the Hereford 53.74, and for the baby beef 57.10. Had this yearling been finished it should have won hands down; and before long, the Breeders' Gazette predicts, the agricultural or live stock shows will have no classes for 2-year-old fat steers, leave alone 3-year-olds; the limit will be the yearling, the baby beef.

TABLE V.

## CUTS AND VALUES.

	Steer No. 0	Steer No. 4.	Steer No. 7.
Loins @ 25c.....	176¼ lbs. \$44.06	167¼ lbs. \$41.81	116½ lbs. \$29.13
Rounds and ribs @ 22½c .....	240¼ lbs. 54.06	263¼ lbs. 57.92	191 lbs. 42.97
Chucks @ 20c.....	152 lbs. 30.40	154 lbs. 30.80	111 lbs. 22.20
Cross ribs and plates @ 17½c..	161½ lbs. 28.23	161 lbs. 28.15	118 lbs. 20.23
Total Beef Value.....	\$156.75	\$158.68	\$114.53

In order to decide the beef value, actual and relative to the live weight and dressed carcass weight, the retail prices for the various beef cuts, as sold at Puunene, Maui, were taken as a basis. These figures explain themselves, and it is unnecessary here to go into the lack of discrimination which places a difference of only 5c per pound between porterhouse steak and stew. The scale remains the same for the three, and the heaviest steer brings the most money. But when we go a step further and look into the cash value of the three carcasses as compared with their live weights and dressed weights, we get a better idea of which animal is the best, or rather which one puts the most money into the producer's pocket.

TABLE VI.

	Steer No. 0.	Steer No. 7.	Steer No. 4.
Live Weight Coefficient.....	13.236	12.979	11.683
Dressed Weight Coefficient.....	20.755	20.541	20.692

The live weight coefficient is the cash value of the beef car-

cass divided by the live weight while the dressed weight coefficient is the same divided by the dressed weight. It is easily observed that in the latter class the baby beef assumes second place and is very little behind the leader, the Angus steer.

As already stated, had the baby beef been finished it would have come out winner. As it is, the laurels must go to the Angus steer. That is as it should be, according to precedent, and possibly to merit.

In all, or nearly all, carcass contests, the black blood, either straight or in a high grade cross, has won out. In the case before us the Angus carcass showed up superior to the two Herefords, being evenly covered with fat, not excessive at any point, and smooth throughout. The cuts also were everything that could be desired in regard to form, thickness, finish, quality, soundness and weight. This, however, should not be read to detract from the merits of the Hereford carcasses. It is conceded that the Herefords do not distribute their fat as evenly as do the Angus and the Shorthorn, still the beef itself appears to be equally well "marbled." Until this minor deficiency has been bred out of the breed the Angus will probably remain the favorite of the feeder who competes for honors in the fat steer and carcass contest classes. This show ring excellence, however, does not proclaim the Angus the superior breed for our local conditions. As a "rustler" for instance, the Angus is out-classed by the Herefords, and where watering places are far apart and where periodical droughts may be expected the Hereford is by far the safer breed.

In awarding the prize of the contest to the Angus steer, the writers commend future exhibitors not to overlook the lessons contained in the record of the yearling steer (No. 4), the baby beef.

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## Division of Forestry

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Honolulu, Hawaii, September 30, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of September, 1919:

### TREE PLANTING.

During the month 2,208 red gum trees and 1,982 ironwoods were planted at Mikilua, Oahu; 270 mahogany and molave, *Viter parviflora*, at Waiahole, Oahu; and 125 koa replants were set out in Makiki on the Honolulu Watershed Reserve, making a total of 4,585 trees.

On the Waiahole Reserve, Oahu, at the lower edge near the forest reserve boundary, on open land, a total of 530 true mahogany and molave trees have been planted out since June 1, 1919, and the trees first planted are doing very well. It is planned to establish at this place a series of

experiments in which kauri pine, araucarias, and Japanese cedar trees will be planted out under close spacing conditions.

The Forestry Division of the H. S. P. A. has kindly turned over to this Division some surplus trees which they can not well use, consisting of 1,000 kauri pine and 2,000 Norfolk Island pine.

Seed of the following species of trees which I obtained in Hawaii in August have been turned over to the Forest Nurseryman for germination: *koa*, *Acacia koa hawaiiensis*; *alani*, *Pelea* sp.; *olapa*, *Cheirodendron Gaudichaudii*; *hau* *kuahiwi*, *Hibiscadelphus Giffardianus*; and *naio*, *Myoporum sandwicense*.

A supply of 12 pounds of clean *koa* seed has been secured from the slopes of Mauna Loa, Hawaii, at an elevation of 5000 feet above sea level.

#### FOREST PROTECTION.

District Fire Warden D. S. Macalister reports from Kukaiau that from September 5-10, he and his men shot and roped and thus removed from the government land of Piha in the Hilo Forest Reserve, Hawaii, 3 large bulls, 2 cows, and 4 heifers, a total of 9 head of wild cattle.

On September 16, word was received from Commissioner Giffard of the discovery of an infestation of the fern weevil, *Syagrius fulvitaris*, in the *amaumau* ferns, *Sadleria cyatheoides*, in Section B of the Olaa Forest Park Reserve at 29 Miles on the Volcano Road, Olaa, Hawaii, and on the same day, after consultation with President Rice, permission was secured from the Superintendent of Public Works to employ non-citizen labor and instructions forwarded to Ranger Mackenzie to hire a gang of men and undertake at once the clearing up of the ferns under the direction of Commissioner Giffard. Further developments in connection with this infestation are described in my special report submitted herewith.

#### KAUAI TRIP.

From September 19 to 27, I was on the Island of Kauai, after an absence of 15 months, making a general inspection and investigation of matters which required immediate attention.

#### KEALIA RESERVE ELIMINATION.

A thorough examination was made of a portion of the government lands of Kamalomaloo and Anahola consisting of approximately 760 acres of open, treeless, grass land in the Kealia Forest Reserve and a special report recommending its elimination will shortly be submitted to you for consideration.

#### HALELEA FOREST RESERVE.

A visit to the boundary of the Halelea Forest Reserve where it is adjacent to the leased lands of Waioli and Hanalei disclosed the fact that the fences, required by the general leases to be built in 1912 and 1911, respectively, had not been constructed and that cattle consequently had access to the forest reserve at these points. This matter was at once taken up with the Land Commissioner, who was requested to enforce this provision in the leases.

#### FOREST FIRES AT HANALEI.

It was also discovered that there had been several recent fires on the Hanalei side of the Hanalei-Waioli ridge. Inquiry from District Fire Warden Sanborn, who had not reported them, elicited the information that they were started by a native throwing a lighted cigar into the dry staghorn fern. The Warden has been requested to secure all possible evidence which will lead to the arrest and conviction of the responsible

party, has been supplied with fire warning notices to be posted throughout his district, and has been urged to do everything possible to prevent the starting of fires in this important water-conserving forest reserve.

#### LIHUE-KOLOA FOREST RESERVE.

An inspection was made of the makai boundary of the Lihue-Koloa Forest Reserve where it crosses the private lands of Haiku and Hanamaulu and the government land of Wailua. The boundary across Haiku is unfortunately not fenced and the tame cattle consequently have access to and are damaging the forest on the wet boggy watershed area which is an important source of supply for the ditch systems conveying water to the cane lands of Koloa, Haiku, and Kipu.

#### ELIMINATION OF WILD CATTLE.

The boundary across Hanamaulu is fenced and no cattle are in the forest reserve. The boundary across Wailua is also fenced and a few wild cattle are still within the reserve. During 1918, the Lihue Plantation Co. removed from the forest reserve in Wailua approximately 200 head of cattle which had been lost track of, and since January of this year 25 head have been killed. The remaining cattle are mostly old bulls, two of which were shot at the time of my visit, and are very wild and consequently dangerous. On account of this and of the difficulty with locked gates should hunting permission be granted indiscriminately, I have requested the Lihue Plantation Co., which keeps the forest reserve fence in repair, to remove the remaining 8 or 10 head of wild cattle, and have given the company, which is equipped for this purpose, until October 1, 1920, to accomplish this.

#### CHANGE IN FOREST RESERVE BOUNDARY.

In this region there is an area of open grass land between the original forest boundary, which goes from point to point on long courses, and the actual forest fence on the ground, which in my opinion should be eliminated from the reserve, by using the forest fence as the official boundary. With this in view, I have requested the Government Surveyor to supply me with a description of the fence line and will submit the matter for your consideration.

#### WOOD CUTTING IN RESERVE.

An inspection was made of the ridge, back of the hill called Kapiliwahine, between the government land of Kalaheo and the private land of Wahiawa within the Lihue-Koloa Forest Reserve, where the McBryde Sugar Co. has constructed a road and is hauling dead wood out of the forest by ox teams. Being unable to determine on the ground whether any of the wood had been cut from government land, I have requested the Government Surveyor to locate and mark the boundary between these two lands.

#### PAPAPAHOLAHOLA SPRING RESERVE.

An inspection of the Papapaholahola Spring Reserve at Kalaheo showed that the boundary fence and gate were in need of repair. I have consequently supplied our one laborer at this reserve, Joe Rita, with the necessary wire and lumber and authorized him to hire one laborer for one month to assist him in making the necessary repairs and in planting an additional  $1\frac{1}{2}$  acre of land which is still in need of reforestation.



## KOOKEE CAMPS

Two days were spent in the Halemannu and Kokee region inspecting the camps and checking up violations of the conditions in the permit. Of the total of 48 camp sites, permits for 27 have been issued. Of these, 7 had improvements on them before the land came under our control and since then 5 have had buildings constructed on them. Only 15 camp sites were occupied this summer. All the campers had departed and only the ranger station was occupied by Ranger Hardy.

## WOOD CUTTING

A case of what appears to be illegal wood cutting was encountered on land near Kokee but still covered by General Lease No. 164. About 40 live lehua trees of different sizes were found to have been cut and some partly dragged out to the trail. The matter has been reported to the Land Commissioner who still has jurisdiction over this area.

## FENCING REQUIREMENTS.

Inspections were also made of the government lands of Mokihana, Waimea, and Wailua adjacent to forest reserve boundaries in order to secure data which will serve as a basis for fencing clauses which will be recommended to the Land Commisisoner for inclusion in the new leases of these lands.

## LECTURES ON FORESTRY.

At the request of the President of the College of Hawaii I have accepted an invitation to give three lectures on Oct. 27 and 29, and Nov. 1, on our forest problems at the short course for plantation men to be held under the joint auspices of the College of Hawaii and the H. S. P. A.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, October 1, 1919.

Superintendent of Forestry, Honolulu, T. H.

Dear Sir:—I herewith submit a report of the principal work done during the month of September:

## NURSERY.

## Distribution of Plants—

Sold: 50 transplants in boxes; 162 potgrown.....	212
Gratis: 150 transplants in boxes; 799 potgrown.....	949
Total .....	1161

## Collections Government Realizations—

Collections on account of plants sold.....	\$ 4.35
Rent of office, nursery grounds, August.....	35.00
Total .....	\$ 39.35

Collections on Preservation Forest Reserves for Quarter  
Ending September 30, 1919—

Menota, rent of premises at Half-way House, Tantalus, for July, August and September.....	\$ 30.00
Lizzie Tong Wai, fee for use of land and gathering ti leaf Pauoa Valley, July, August and September.....	12.50
Yoshida, rent of small piece of land Pauoa Valley, April 1, 1919, to April 1, 1920.....	3.00
Sale of Charcoal—	
Kim Chong, 5 bags of charcoal at 76 cents.....	3.80
Territorial Marketing Division, 160 bags of charcoal, including commission .....	96.00
	<hr/>
	\$145.30
Sale of Cordwood—	
M. S. Salema Jun, 26½ cords dead wood from upper Olaa Forest Reserve at \$1 per cord.....	26.50
Rent for Kokee Camp Sites—	
Geo. B. Tuttle (July 7) site 15A to Dec. 31, 1919.....	5.50
Mrs. A. J. Gignoux and Mrs. Bockus (July 23) site 27 to December 31, 1919.....	2.90
Richard B. Gurrey (July 23) site No. 30, to Dec. 31, 1919.....	3.75
Philip L. Rice (Sept. 10) site No. 32, to Dec. 31, 1919.....	2.33
Sale of Black Sand—	
138 loads black sand (Sept. 30) at 50 cts.....	69.00
Total .....	<hr/>
	\$255.28

PLANTATION COMPANIES AND OTHER CORPORATIONS.

The distribution of plants under this heading amounted to 800 transplants in boxes and 1500 pot grown, making a total of 2300. We have on file orders for 10,000 transplants to be delivered when ready.

GRASS FIRE.

On October 1, about 12.30 noon, we were informed that a grass fire was raging on the land adjoining and Ewa of the Country Club in Nuuanu Valley. The writer and men from the Nursery started out at once and found the fire spreading along the face of the ridge Ewa of the Country Club. The fire had already climbed over the ridge and on the Alewa Heights land. Fire Chief Thurston and his men were fighting to keep the fire from Alewa Heights property and with the men from the Nursery and those from the Country Club the fire was beaten out along the rocky slope leading up to Alewa Heights and prevented from spreading mauka where considerable trees and shrubs are growing. We worked at the fire about three hours before it was entirely out. The fire was started by men employed by the Country Club who were burning a strip of land along the side of the golf course. The fire evidently got away from them.

MAKIKI STATION.

The work at this station has been principally routine. We have a

number of koa trees potted and ready for planting on the bare parts in the watershed when the weather becomes favorable.

#### HONOLULU WATERSHED.

The work done on this watershed has consisted of clearing trails, hoeing trees, etc.

#### ADVICE AND ASSISTANCE.

The writer made a trip to Schofield Barracks for the purpose of giving advice in regard to planting trees, etc. Fort Armstrong was also visited at the request of the commanding officer and advice given in regard to planting and laying out the grounds. We have a number of trees selected and set aside for planting at Fort Armstrong.

The writer has made the following number of visits and given advice and assistance otherwise at the request of people from in and around the city:

Visits made .....	6
Advice by telephone .....	5
Advice to people calling.....	8

The writer has been asked to assist in judging the plants at the Maui County Fair by the Plant committee, and consequently will be absent from Wednesday, October 8, to Saturday, October 11.

Respectfully submitted.

DAVID HAUGHS.  
Forest Nurseryman.

## Division of Entomology

Honolulu, Hawaii, September 30, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—During the month of September the insectary handled 22,600 pupae of the melon fly, from which there were bred 3732 females and 3170 males *Opius fletcheri*.

The distribution of parasites was as follows:

#### MELON FLY PARASITE.

*Opius fletcheri*.

Oahu:

	Females.	Males.
Moiliili .....	700	900
Wahiawa .....	600	1050
Waipahu .....	550	500
Hawaii:		
Kapoho .....	300	300

#### FRUIT FLY PARASITE.

*Opius humilis*.

Oahu:

Kalihi .....	400	400
--------------	-----	-----

*Diachasma tryoni.*

Oahu:		
Kalihi .....	500	550

*Diachasma fullawayi.*

Oahu:		
Kalihi .....	50	50

*Tetrastichus giffardianus.*

Oahu:		
Kalihi .....		7900

*Galesus silvestri.*

Oahu:		
Nuuanu .....		1000

*Dirhinus giffardi.*

Oahu:		
Nuuanu .....		850

While collecting insects at Kilauea in company with Commissioner Giffard it was discovered that the Australian weevil, *Syagrius fulvitaris*, is infesting the ferns of the forests at 29 Miles. Although the weevil has been known in Hilo for a number of years, it was never before observed outside of green-houses on Hawaii. A thorough survey was made at once and it was determined that the infestation was continuous and confined to a rather small area. In view of this fact and the great danger to the forests in case the infestation should spread, steps were taken to eradicate the insect in the circumscribed area by cutting and burning its food plant and going over the ground thoroughly with a torch flame to destroy the adult beetle. It is a fortunate circumstance that the weevil does not fly and is dependent on one or two of the ferns in the native forests. It will be necessary however to maintain a very close inspection of the area to prevent further spread.

Respectfully submitted,

D. T. FULLAWAY,  
Entomologist.

## Division of Plant Inspection

Honolulu, Hawaii, September 30, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—I respectfully submit my report of the work carried on by the Division of Plant Inspection for the month of September, 1919, as follows:

During the month 45 vessels arrived at the Port of Honolulu, 17 of which carried vegetable matter and 3 vessels came through the Panama Canal Zone. The following disposal was made of the various shipments:

Passed as free from pests.....	926 lots	16,066 packages
Burned .....	46 "	46 "
Fumigated .....	8 "	8 "
Total Inspected .....	980 "	16,120 "



Of these shipments 15,905 packages arrived as freight, 99 packages as mail and 116 as baggage.

### RICE AND BEAN SHIPMENTS

During the month 13,454 bags of rice, and 3013 bags of beans arrived from Japan and were found free from dangerous insect pests.

### PESTS INTERCEPTED.

Approximately 4161 pieces of baggage belonging to immigrants from foreign countries were examined, from which 15 lots of fruit and 23 lots of vegetables were taken and destroyed.

On September 3, 5 packages of forest tree seeds found in the mail from Siam were fumigated as a precaution. Also 2 packages of corn from Manila and Japan respectively were seized and destroyed as contraband. One package of palm seeds from Java was also destroyed, being prohibited without a permit of the Federal Horticultural Board. Also 10 baskets of lily bulbs found in the cargo from the Orient were seized and held awaiting a permit from Washington, D. C.

On September 9, 1 bag of corn in the cargo from Guam, via San Francisco, was seized and destroyed, being contraband.

On September 17, 5 baskets of lily bulbs in the cargo and one basket as baggage from the Orient were seized and held awaiting a permit from Washington, D. C. Also one package of silk worm cocoons for medicinal use, found in the mail from Japan, was fumigated as a precaution. One package of loquat seeds from Japan was destroyed on account of weevils.

On September 18, one package of fiscus seeds for the Board of Agriculture and Forestry, found in the mail from Calcutta, India, was fumigated as a precaution.

On September 26, one package of nuts and herbs for medicinal use, and one package of seeds for the U. S. Experiment Station found in the mail from Manila were fumigated as a precaution.

### HILO INSPECTION.

Brother M. Newell, Inspector at Hilo, reports the arrival of six steamers at Hilo but none brought freight of a vegetable nature. By mail there arrived 11 packages of seeds and two packages of plants, all free from pests. Owing to the strike at the port of San Francisco, the usual shipments have been delayed.

### KAHULUI INSPECTION.

Mr. Edwin C. Moore, Acting Inspector at Kahului, reports the arrival of 7 vessels at the port of Kahului, 1 of which carried fresh fruits and vegetables consisting of 4 lots and 481 packages all being free from pests.

### INTER-ISLAND INSPECTION.

60 steamers plying between Honolulu and other Island ports were attended and the following shipments passed as free from pests:

Taro .....	584	packages
Fruit .....	160	"
Plants .....	128	"
Vegetables .....	340	"
Seeds .....	14	"
Pineapple suckers .....	4928	"
Sugar cane .....	19	"
Total passed .....	6173	"

Seventeen packages of plants and 3 cases of sugar cane were refused shipment on account of infestation, undesirable soil and not complying with the regulations.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

## Division of Animal Industry

Honolulu, ,Hawaii, Sept. 30, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of September, 1919:

### ANIMAL QUARANTINE STATION.

At the above station two large and four small pens have been rebuilt, and the station is in good shape. The work became necessasry as a great number of horses and mules arrived here during the month and have been kept the requisite time at the station. Most of these animals were army horses and mules and taxed the station's capacity. The total number of animals reached nearly 250 head.

We have also during the month planted more than 500 young trees for shade purpose.

### TUBERCULOSIS CONTROL.

No testing has been done this month, as the time was taken up in slaughtering 85 head of the reacting cattle, all of which were found on post mortem examination to be affected with tuberculosis.

No word has been received from Washington in regard to the cooperation with the Federal Bureau of Animal Industry in tuberculosis eradication.

The various questions which have arisen as to the interpretation of the Federal cooperative regulations have been taken up with the Attorney General, who still has them under consideration.

Respectfully submitted.

VICTOR A. NORGAARD,  
Territorial Veterinarian.

### REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, September 30, 1919.

Dr. V. A. Norgaard, Chief, Division of Animal Industry, Board of Agriculture and Forestry, Honolulu.

Sir:—I beg to submit the following report for the month of September:

### TUBERCULOSIS CONTROL.

The work in this line was confined to the slaughter and post mortem examinations of cattle condemned during the month of August. A total of 85 head of reacting cattle were disposed of in this manner and

all were found to be affected with tuberculosis. Four carcasses were condemned as unfit for human consumption.

### IMPORTATIONS OF LIVESTOCK.

During the month a total of 38 vessels were boarded by the Live Stock Inspector and the following were found to carry live stock:

- S. S. Colusa, Calcutta—1 dog, Thomas Smith.
- S. S. Manoa, San Francisco—1 dog; 14 crates poultry.
- S. S. Sonoma, San Francisco—2 pups, W. L. Livingston.
- S. S. Great Northern, San Francisco—1 dog, W. H. Johnson.
- S. S. Hyades, San Francisco—31 horses, 69 mules, U. S. Government;  
4 hogs, Alexander & Baldwin; 3 crates poultry.
- S. S. Lurline, San Francisco—16 mules, Schuman Car. Co.; 12 horses,  
T. H. Davies & Co.; 115 horses, U. S. Q. M. Dept.; 2 crates poultry.
- S. S. Shinyo Maru, San Francisco—1 dog, E. M. Brown.

Respectfully submitted.

LEONARD N. CASE,  
Assistant Territorial Veterinarian.

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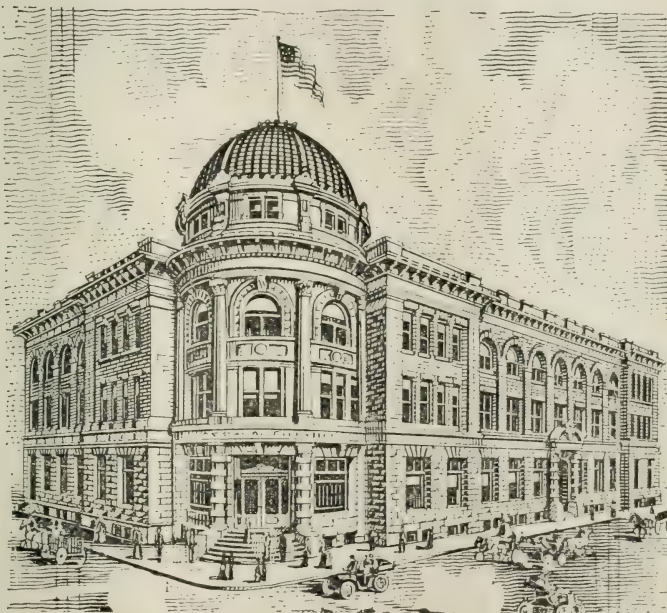
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

NOVEMBER, 1919

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

VOL. XVI.

HONOLULU, NOVEMBER, 1919.

NO. 11

## Forestry in Hawaii

(By C. S. Judd, *Superintendent of Forestry.*)

### I. THE BENEFICIAL EFFECTS OF FORESTS.

#### *Classification of Forests.*

Forests are usually classified under three main heads, according to the uses to which they are put: 1. The supply forest. 2. The protection forest. 3. The luxury forest.

#### *The Supply Forest*

In general, the first and foremost purpose of a forest growth is to supply us with wood material or parts of the wood substance. It is the trees themselves, not their fruit, their beauty, their shade, or their shelter that constitute the primary object of this class of woodland. Wood, the chief product of a supply forest, is the most widely used of all materials and from the cradle to the coffin, in some shape or other, surrounds us as a convenience or a necessity. It is the material on which our civilization is built and so general and far-reaching has its use become that a wood famine, however improbable its occurrence, would be almost as serious as a bread famine.

Owing to the lack in this Territory of a natural supply of timber trees, our lumber for building material and wood supplies for other purposes must be imported from elsewhere. To be sure, in the early days before the advent of the white man, the native forest supplied the modest demands of the Hawaiians for the wood materials which they needed for their bodily comforts and necessities in the form of house rafters, posts, and thatch poles, poi boards, pig dishes and finger bowls; their demands for transportation in the form of logs for their dugout canoes; for defence in the form of hardwood for spears, javelins, clubs and daggers; for pleasure in the form of surf-

\*A series of lectures delivered on October 27 and 29 and November 1, 1919, at the short course for plantation men at the College of Hawaii, Honolulu.



boards and sleds; and for their religious rites in the form of soft and hard woods out of which they carved their idols. But with the advent of the white man, who brought with him iron and steel, sawn lumber and manufactured articles, these demands on the native forests ceased or became so negligible that the forests on our mountain slopes may no longer be looked upon as supply forests, so far as the production of wood is concerned.

The extensive woodlands of the introduced algaroba tree found usually on the lee side of these islands at the lower elevations may, however, be considered as true supply forests, for their growth is encouraged mainly for the wood which they produce and the pods and bee pasturage they afford. The plantations of the introduced eucalyptus and ironwood trees set out on the foothills for the avowed purpose of fuel production come also in this class of forest.

### *The Protection Forest.*

This is a forest whose chief value is to regulate streamflow, prevent erosion, hold shifting sand, or exert any other indirect beneficial effect. Besides the primary object of forest growth, that of furnishing wood or parts of the wood substance, it is recognized that forest growth serves an object in the economy of nature and of man which under certain conditions may become equally if not more important than this direct primary one. This is certainly the case in Hawaii and it is the protection forest that will be my main theme.

### *The Luxury Forest.*

When pleasure and game are the main objects sought in the establishment or administration of a forest, such a one is called a luxury forest. We are not concerned with this class of forest here except on a very small scale in the form of picnic grounds and parks which are used exclusively for recreational purposes.

### *Value of Protection Forest.*

The value of the native Hawaiian forest as a protection forest lies chiefly along two general lines, the regulation of streamflow and the prevention of erosion. These are two positive and beneficial influences which a protection forest exerts and which have been recognized, although not heeded, since the time of the oldest civilized men when, as is evidenced by many sayings of Roman and Greek writers, the fact was appreciated that forest cover had some influence upon its surroundings, upon climate, health and the water conditions of a country, and far-sighted priests prevented the destruction of forests by consecrating them as sacred groves.

Before taking up these two chief beneficial effects of a protection forest, let it be said that a large number of other beneficial influences have been ascribed to the forest. Some of these, while rather intangible, are certain, but others are somewhat extravagant and without much sure basis.

### *Beneficial Influences.*

The time is too brief for a detailed discussion of these assertions but they may thus be briefly summed up:

It has not yet been definitely proved by mathematical means that forests produce rain, because both instruments and methods of meteorological inquiry are as yet unsatisfactory. When, for instance, rain gages will, according to their construction, the manner of their position and the character of the wind and rain, during the same storm, register amounts varying from 7 to 40 per cent, we are without any means of applying a constant factor of correction, and it would appear that no reliance can be placed on such measurements for the purpose of determining the difference of rainfall within and without a forest. Several observations must therefore be relied upon.

The forest, however, does exclude the sun and wind from the soil and the air temperatures and air humidity are modified. The annual evaporation within the forest is about one-half of that in the open field, while the quantity of moisture thrown into the air by transpiration from the leaves in the forest is sometimes three times that from horizontal water surface of the same extent.

From these statements we would expect as a consequence of deforestation an effect on the climate of a deforested area in three directions, namely:

1. Extremes of temperature of air as well as soil are aggravated.

2. The average humidity of the air is lessened and, possibly,

3. The distribution of precipitation throughout the year, if not its quantity, is changed. The tendency of a forest growth, therefore, would be, on account of its cooling effect, to keep the air within and to some extent the air above it nearer saturation, and as a consequence it might occur that moisture-bearing currents passing over it would precipitate their moisture more readily above or near the forest growth. This influence is only of a local character, for, to make an appreciable difference in the amount of rainfall, it would appear that the forest area must be of considerable extent. It cannot be put in comparison with that of the large oceans, the great air currents and the extensive mountain ranges which determine the general climate. The size and character of the forest, its density, height, situation, and composition, are of great importance in determining its influence.

### *Effects of Windbreaks.*

A positive and more readily conceivable effect of a forest growth on moisture conditions of the air is that which it has in common, probably in increased degree, with the so-called wind-break. The mechanical obstruction which a forest represents is the principal effective element. By breaking the velocity of dry winds and possibly enriching them somewhat with moisture, the rate of evaporation over a neighboring field is considerably reduced, so that, in regions where winds are common, the protection shows itself in increased crops on protected fields. A demonstration of this may be found along the North Hilo and Hamakua coasts on the Island of Hawaii, where windbreaks, mainly of ironwood trees, are planted at the edge of the cliffs overlooking the ocean and are an effective means of protecting the cane to leeward not only from the strong northeast trades, but from the salt deposits which they carry with them from off the ocean.

### *Regulation of Streamflow.*

It is the beneficial effect of forests on the rainfall, after the rain has fallen, that interests us in a tangible manner, for there is no influence of the forest that is of greater importance in the distribution of water supplies than its effect in retarding the runoff. To be sure, the topography and the geological structure exert a powerful influence which a forest cover may either not be sufficient or else is not needed to modify. It is noticeable, however, that the streams arising from a watershed that is well forested rise more slowly after a storm, remain in flood for a longer period of time, and fall more slowly than similar streams in non-wooded areas. As the rain will flow off the bare roof of a house very rapidly, so will the runoff come away from a watershed that has no retarding forest cover upon it.

This influence of a forest cover in regulating the streamflow is based on the principle that rain waters penetrate more readily a forest-covered soil than one that is bared of a protective cover.

This action is manifested in three ways:

First, the mechanical obstruction which the foliage of a forest offers reduces the amount of water that reaches the soil and lengthens the time during which it can do so. The foliage, together with the loose litter of the forest floor, also reduces the compacting effect of the raindrops and the drying effect of sun and wind and keeps the soil granular, so that the water can easily percolate.

Second, The mechanical obstruction which the litter, underbrush, and trunks, and possibly here and there moss, offer to the rapid surface drainage of waters, lengthens the time during which this percolation may take place.

Third, the network of deeply-penetrating roots, live and de-

cayed, offers additional channels for a change of surface drainage into sub-drainage.

In these operations the condition of the forest cover has much to do with the degree of its effectiveness and the condition of the forest floor is of more moment than that of the leaf canopy. Although on a forested area the tree growth may be left intact, yet, if the loose litter and underbrush have been burned off and the soil has been compacted by the trampling of sheep or cattle, the effectiveness in regulating streamflow is much impaired.

The forest cover, therefore, tends to convert the surface runoff into underground runoff or percolation. This is desirable, because the former is likely to do injury by eroding the soil, while the latter is generally beneficial to vegetation in the formation of springs and in raising the water level in the soil. It is particularly desirable in these islands wherever there are artesian basins which are drawn upon by pumping and which must perforce be replenished with water by this natural method.

A concrete example of this is offered on the Island of Oahu, which is roughly 600 square miles in area, and on which it is estimated there falls annually enough rain to cover the island to a depth of five feet. Of this total precipitation, it is estimated that there reaches the sea or is lost through evaporation, the equivalent of a depth of  $3\frac{3}{4}$  feet, leaving  $1\frac{1}{4}$  feet of water over the 600 square miles to be the flow of the artesian wells and surface springs together. Anything that will tend to increase this proportion is evidently most desirable. The rainfall in these islands is comparatively heavy and the catchment areas are relatively small, the stream gradients very high and the runoff from deforested and barren slopes very rapid with resulting erosion and damage to agricultural soils. The only satisfactory way to prolong this runoff is by means of the cover afforded by protection forests which will retain at least a portion of the rainfall and feed it gradually to the surface and underground water sources, thus serving as a regulator to decrease floods, and to increase the dry season discharge.

In these islands, under tropical conditions, the virgin forest is much more dense than in other places and the beneficial or destructive effects of a forest cover or the lack of it is proportionately greater than elsewhere. There is probably no other part of United States territory where the relations between available waters and forest cover are more intimate and more delicate or where the natural balance is more easily disturbed with disastrous results.

This distribution of the water, which lengthens the time during which the atmospheric precipitation can be employed, and which under circumstances in some regions may lengthen the supply for years, the water reaching the river or the artesian basin a long time after it fell on the mountain top, renders springs and artesian basins independent of wet and dry seasons, and equalizes



their flow,—a condition of great importance for all industries dependent on irrigation and waterpower.

### *Prevention of Erosion.*

In close connection with these effects of forest cover upon the flow of water stands its influence on the stability of the soil. The tendency of the rain waters falling on hills and mountains is to carry in their descent to the valley loose particles of soil with them and as the little rivulets run together and acquire force gravel, stones, and even large rocks and boulders are broken loose and moved to lower levels by the torrent. This action, known as erosion, takes place everywhere more or less rapidly, according to the presence or absence and character of the soil cover and no better or more efficient protection against it is to be found than a dense forest cover. The forest alone is capable of obstructing the mechanical effect of the rainfall upon the soil, and retarding the rapid surface drainage which becomes the carrier of the debris. Here, again, the condition of the forest floor, rather than the tree growth, is the effective element.

The losses caused by preventable erosion are enormous, have ruined many sections of what was productive country, and have a far-reaching effect. While this erosion, which has followed deforestation in parts of these islands, may be manifested on a smaller scale in this Territory, the examples displayed in other countries should be a warning for us to prevent it wherever possible by protecting our present forests and extending them where their beneficial effect is needed.

The removal of a forest covering from the mountains and hills results in a largely increased burden of solid material in the rivers. Upland meadows, in spite sometimes of even a grass covering, are gullied and scoured until they are turned into worthless lands. The sediment is carried to the lower-lying regions and much of it is deposited in the stream beds. The river channels become so filled that navigation is greatly hindered or constant dredging must be resorted to. Also, where storage reservoirs have been built by constructing dams, the sediment is deposited in the reservoirs and reduces their capacities. The silt carried by some of the rivers in the United States amounts to millions of tons annually and erosion renders large areas of fertile soil un-fertile and at least temporarily useless for human occupancy.

The pasturage of sheep in the Alps of Southern France which resulted in the removal of the cover from the forest floor was the chief cause of the destructive torrents with which the French government has been struggling for many years and has spent over 35 million dollars in trying to correct. The examples of the destructive results caused by erosion and floods, following deforestation, are very numerous. Most of the springs and brooks of Palestine, familiar to you from your Bible reading, and with them the fertility still celebrated in the early middle ages, have

gone. Forests and civilization seem to be bound together inseparably.

The whole north coasts of Africa, Palestine, and China were at one time well forested and, with the vanishing of the trees, these civilizations waned and are now at a low ebb.

China is probably the best example of deforestation which we have. Originally a country of great wealth, both in timber and agricultural lands, the removal of the woods over very large areas resulted in the destruction of the farms by allowing the rainfall to rush unchecked down the hillsides in the form of torrents, carrying large amounts of sand and gravel which have covered up and destroyed the arable lands, drowned out the inhabitants, and caused starvation from loss of crops and stoppage of trade which has amounted to hundreds of millions of dollars. Today a large part of China is a desolate, treeless country, where the inhabitants are forced to use dung for fuel and to carry on the most intensive form of agriculture in order to wring a meagre sustenance from an impoverished soil. So scarce is wood fuel in certain districts, due to China's indifference to forest protection in past times, that the country has just begun to wake up and the citizens are encouraged to plant trees by a drastic law, making death the penalty for theft of young trees.

The flood problem in China will not be permanently solved until the different watersheds are properly clothed with trees and protected.

### *Purity of Water.*

Forests influence favorably not only the abundance and continuity of the water flow, but its purity. Each of you will recall that as a rule clear and pure water is found in mountainous regions. Knowing that a large number of diseases are bred in soils, it becomes essential that the drinking water carry as little soil particles as possible, and although, by artificial means of filtration and sedimentation, the river water may be freed of sand and bacilli, we have more assurance of freedom from disease, if the water comes from a well-forested region where no pathogenic bacteria are produced.

### *History of Forest Treatment.*

From every point of view the forest is one of the most helpful friends of man and perhaps no other natural agent has done so much for the human race and has been so recklessly used and so little understood.

The history of the forest has been the same in all parts of the world, progressing according to the cultural development of the people.

First, the forest was valued only as a refuge for game; then it appeared as an impediment to agricultural development, as an

undesirable encumbrance of the soil and the attitude of the settler was of necessity unfriendly to the forest and the need for farm and pasture led to forest destruction. Next, restrictions are made in forest use and protection against stock and fire and, in the case of the supply forest, conservative lumbering takes place. This is followed by some positive efforts to secure regrowth by fostering natural regeneration or by artificial planting and the practice of silviculture, or the art of producing and tending a forest, begins. Finally, a management of the forest for continuity—organizing existing forest areas for sustained yield or for the permanent beneficial influences which they exert—forest economy, is introduced.

Forestry is an art born of necessity as opposed to arts of convenience or of pleasure. Every step of the way toward wise forest use, the world over, has been made at the sharp spur of want, suffering, or loss. As a result, the science of forestry is one of the most practical and most directly useful of all the sciences. It is a serious work, undertaken as a measure of relief, and continued as a safeguard against future calamity.

### *Value of Hawaiian Forests.*

The native Hawaiian forests may be looked upon chiefly as protection forests, exerting many beneficial influences, and which also supply a product, the most evident outcome of such forests, in the form of water. These forests benefit not only the immediate lands but distant areas as well by supplying water for irrigation and, to a small extent, by furnishing electric power for pumping water.

On the windward districts of the several islands, where the rainfall amounts to 3 and 4 hundred inches a year, the true function of these protection forests is manifested by the prevention of destructive floods and excessive erosion and by lengthening the time during which the precipitation may be employed, particularly by furnishing a more constant supply of flume water and water for domestic use in camps and settlements.

On the leeward side of the islands, which often offers a very fertile soil but which as a rule is so decidedly arid that cultivation of crops is possible only by means of irrigation, these forests again show their value by furnishing water—the agricultural lifeblood of the land—which makes not only the growing of crops but human habitation in such regions possible.

This second consideration is more readily appreciated by reference to the production figures for last year's crop of sugar in these islands. Of the total of 573,858 tons of sugar produced in the 1918 crop, on an aggregate area of 119,747 acres, over 70% of the tonnage was secured from the irrigated plantations, which covered 65,164 acres. Moreover, the yield per acre on such plantations was more than twice as much as the yield per acre on the unirrigated plantations.



Any influences therefore which affect adversely the forests, which have such a direct relation to a constant and adequate supply of water, are a menace to the main industry of this Territory and consequently to the prosperity and happiness of its people.

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## II. THE NATIVE HAWAIIAN FORESTS.

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### *Origin of the Hawaiian Forests.*

The question of the origin of the native Hawaiian forests or of where our forest trees came from has received more or less attention by botanists who have expounded their theories, but is a subject which does not concern us to any great extent. As is perfectly well known to you all, these islands are of volcanic origin and are more remote from any continent or high land of considerable extent than any group of similar dimensions on the globe. They moreover contain, in proportion to the entire number of plants, more species that are peculiar to the group than are to be found in any other region of the same area of the world. This last phenomenon is accounted for largely by the isolation of the group but does not settle the question of where our smaller plants and trees first came from. Some have advanced the assertion that the seeds have been brought here entirely by migrating birds, by ocean currents, or by winds, while others, from certain circumstances and the many examples of similarity of plants found here to plants which occur to the south and west of these islands, have added one other source by presenting the theory of an ancient terrestrial plant immigration, when this group was a part of or connected with large continental masses now represented by Australasia and Indo-Malaysia, but which have subsided and are evidenced here now only as superimposed volcanic islands.

The question of where the bulk of our flora came from is not so important as the pressing demand that what remains of it be protected and cared for in the best possible manner so that it will properly serve our needs. It is certain, nevertheless, that however it came, it has been here for a very long time because an endemic fauna of birds and insects restricted to or dependent on certain of our trees has developed and for this development a long period of time has been necessary.

It is possible to account, with more confidence, for the arrival here in prehistoric times of such trees as the kukui, ohia ai, kamani, milo, kou, and breadfruit because they were probably brought by human agency. It was perfectly natural for the early comers, who settled these islands, to bring with them the trees



which they esteemed for shade trees or held in reverence or the trees which yielded them their food, and quite possible, too, because they had room for them in their large seaworthy canoes in which they made their venturesome voyages from Kahiki without the aid of the mariner's compass, the sextant, or the chronometer.

### *Original Extent of the Forests.*

Whatever their origin, our Hawaiian forests must have been much more extensive in prehistoric times than they are now, and covering the upland plateaus, mountain slopes, and lowlands, they were probably limited only by such natural conditions as lack of rainfall, elevation, and lava flows. They also must have influenced favorably the runoff in a more extensive manner, for today we find in the dry districts abandoned taro patch terraces and empty irrigation ditches of ancient construction leading down from deforested watersheds from which living streams have long since ceased to flow.

### *Causes of Decrease—Sandalwood Trade.*

Probably the first contributing agency in the destructive processes which have been responsible for the decrease of the native forests was the sandalwood trade, which began about 1778 and waned in 1829. This trade, to be sure, gave the infant kingdom its start in life and in one year alone \$400,000 was realized from sandalwood shipments made to China. But not only were the mature trees harvested most intensively, but the natives were so hard pressed by the cupidinous chiefs, that they destroyed the young seedlings as well, so that there would be no sandalwood trees left for their children to be compelled to gather.

### *Cattle.*

The next cause of forest destruction in these islands was the bullock, which began his depredations soon after the first cattle, which were landed in 1792 by Vancouver, had multiplied and, because of the tabu which the white men placed upon them, had increased in such numbers that they had finally to be killed off in order to abate the nuisance which they created; only their hides and tallow being salvaged. These herds of cattle evidently roamed unrestricted in the native forests. In those early days there were no fences worth mentioning and the cattle working back little by little into the woods opened up a larger area each year until thousands of acres of land, formerly covered with a dense wet forest, were reduced to open, treeless country. Today this same destructive agency is unfortunately still at work in parts of the Territory.

### *Wood Cutting.*

In some parts of the islands, human agency has contributed largely to forest destruction. In the early days the primitive sugar mills were almost entirely dependent on wood for the fuel used in their furnaces before the improved methods of grinding produced a bagasse that could be used at once under the boilers and naturally the plantation managers turned to the most accessible fuel supply, which was the native forest. The removal of thousands of oxcart loads of native wood for this purpose added to the general forest destruction. Some of this cutting was justified because the ax was followed by the plow and the land utilized for agricultural purposes. It is a matter of common-sense economy always to put the land to its highest use and where good soil is available and the raising of crops upon it feasible, it should most certainly be used for the purpose which will give the greatest return in the long run. In the clearing of such lands, however, too much carelessness was displayed in drawing the line up to which agricultural crops could be raised successfully and too little care given to the remaining forest. In consequence, a great many of the plantations would today have a far better and more permanent water supply and would not have such destructive floods in the rainy season had the forests back of them been given greater protection from the start and not been allowed to deteriorate in any respect.

### *Fire.*

Fire has done its share of destruction in the more arid regions and in the humid forests whenever a drought has dried out the woods sufficiently for fire to run.

### *Insects and Fungi.*

These primary causes of forest destruction have been closely followed up by such attendant ills as insect and fungi attack and the invasion of faster growing introduced weeds and grasses which have formed such a compact ground cover that the native trees have not been able to reestablish themselves by natural reproduction.

### *The Present Forest.*

These agencies, working in combination or independently, have driven the native forest back and altered the area of original virgin forest so materially during the past 150 years that it has been reduced to about 25% of the total land area of the Territory. This record of forest destruction is surpassed in only a few other similar islands. The original forest area of Cuba has been reduced to 20% of its total area, while of the once extensive

virgin tropical forests on Porto Rico, there now remain only isolated remnants scattered over the island in its more mountainous parts and these constitute only 2% of the total land area.

The present area of original forest lands in Hawaii amounts to only about one million acres. Of this, 818,739 acres have been officially included in forest reserves, 68% being owned by the Territory. In addition to the above an aggregate area of about 50,000 acres is held as private forest reserve land, bringing the total area of protection forests up to approximately 870,000 acres.

### *Forest Types.*

What we find left today of the native forest has been classified for the sake of convenience and for descriptive purposes by botanists and divided into groups occupying different zones of elevation and also into sub-groups according as to whether the region is wet or dry or on the windward or leeward side of the island where different conditions obtain. Six of such main zones have been named, as follows: the strand, lowland, lower forest, middle forest, upper forest and bog zones.

For the purpose of forest management, foresters are wont to classify woodland areas into forest types by grouping together stands of trees of similar character as regards composition and development. On this basis, all that we find today in the way of forest growth on these islands of any importance may be classified into four main forest types, naming the types after the distinguishing tree in each.

1. Algaroba type.
2. Kukui type.
3. Ohia lehua type.
4. Mamani type.

1. The *algaroba* type is a comparatively new type made up of a pure stand of this introduced tree and interests us not as a protection forest, although it may exert a protective influence in some localities, but mainly as a supply forest from which wood for fuel, charcoal and fence posts is obtained and which furnishes annually extensive bee pasturage for honey and a valuable crop of beans for stock fodder..

This type occupies the strand and lowland zones of the botanist and has been established in the last 91 years from the original tree which was planted in the Catholic Mission grounds on Fort street, Honolulu, in 1828 and which, by the way, was cut down only last week, on October 23, 1919, to make way for a new building. During this period it has been spread by stock in a phenomenal manner until today it covers throughout the Territory approximately 90,000 acres of formerly waste land and yields an annual crop of 30,000 cords of wood, \$150,000 worth of honey and an unestimated but considerable crop of fodder beans.

The algaroba type is of immense value as a supply forest to many of the sugar plantations, which are fortunately situated

near it, and in this type a rare opportunity is offered for the practise of true forestry, because it is found in the accessible lowlands where the hauling of tree products is easy, it is composed of a tree which is rarely injured by stock and has few natural enemies, a tree which is readily spread by stock, and is fast growing and capable of producing successive crops of valuable wood every six years by sprout growth.

The remaining three types, composed of native trees, are more strictly protection forests and must be managed as such.

2. The *kukui* type corresponds in situation to the lower forest zone of the botanist and in it the *kukui* tree strikes the eye as the predominant tree in most situations, more especially in valleys and lower slopes from about 1000 to 2000 feet in elevation.

3. The *ohia lehua* type corresponds to the middle forest zone of the botanist, running up to 5000 feet above the sea and constituting our "rain" or water-producing forest, is consequently the most important as well as the most extensive type. The *ohia lehua* is the commonest tree in this type, although in certain situations pure stands of *koa* and a variety of other native trees may be found. This type, as a rule, constitutes our main protection forest which equalizes the runoff and because of this it should be given the greatest protection against the inroads of man and beast.

4. The *mamani* type occurs above the *ohia lehua* type but only on the islands possessing the higher elevations of from 5000 to 10,000 feet. In it are found almost pure, rather open stands of the native *mamani* tree with sometimes *naio* and occasionally *koa* and *ohia*. It is our highest, extensive upland forest and is valuable chiefly as a protection to the type just below it.

The *kukui* and *mamani* types both serve in general as protective belts below and above to the water-producing *ohia lehua* type. A great many variations may be found in all three types and one may merge into the adjacent type in such a manner that it is often difficult to tell where one begins and the other leaves off. Nature has provided these intermediate or protective forests as a requisite to the proper and natural protection of the growth in the wet forests and if she had been heeded more closely we would now be in possession of more extensive and more serviceable protection forests.

### *Character of the Indigenous Forest.*

If we examine closely the structure and composition of a typical native, Hawaiian, wet forest in the *ohia lehua* type we find that it is composed of slow-growing, shallow-rooted trees, climbing vines, an undergrowth of bushes and ferns, and of low-growing plants and mosses, an ideal ground cover combination for the conservation of water. Practically all of the native trees have a very shallow root system. A strong tap root is almost always absent and the surface roots, spreading out just under the ground,



depend as a rule not only on the thin layer of humus or rich organic soil, but also on the cover of mosses and roots of ferns and the smaller herbaceous plants composing the undergrowth, with which the tree roots are intermingled, for their sustenance, support and the retention of proper moisture conditions.

In other words, the wet native forest is composed of a society of plants consisting of trees and undergrowth, the upper story of light-demanding trees giving shade to and protecting the lower or second story of shade-enduring plants, this lower story in turn retaining the moisture for and giving food in the form of decomposed vegetable matter to the shallow-rooted systems of the higher trees under which they thrive. Through long association these two main plant forms have accustomed themselves to each other and when one is disturbed the other will suffer. With the removal of the upper story of trees, the sunshine is admitted to the lower story of plants, the ground is dried out, moisture conditions are unfavorably affected, and the plants unaccustomed to the new conditions expire. If the lower or second story is removed, the absence of the protective cover for the roots of the trees induce changes in soil conditions, the roots dry out for lack of moisture and proper plant food, and the trees are gradually weakened, are exposed to the attack of injurious insects and wood-destroying fungi, and gradually die. Any disturbing element, such as cattle in the forest, which enters and begins to change the ideal conditions for this plant association will upset the balance of nature with disastrous results. When once this happens, the cycle of destruction begins, and if allowed to continue the forest is doomed. Insects and fungi rarely attack healthy, vigorous trees, but are always on the watch for trees which have been weakened by disturbed conditions.

With light and soil conditions altered and the sunshine admitted to the ground, the way is then paved for the entry of foreign plants. These, as a rule, are faster growing than the indigenous ones and are therefore able to force back the native growth and conquer the ground so completely that the trees are not able to reseed themselves through the thick matted ground cover. Hilo grass and staghorn fern are two of such plants which, following up disturbances in forest conditions, have wrought immense damage on lands where, if the heavy dense forest had remained, they would never have obtained an entry on account of the heavy shade.

### *Formation of Ohia Forests.*

The establishment of an ohia forest on a new lava flow gives us a clue as to the difficulties of tree growth under our peculiar conditions, and the importance of non-interference with the struggle for existence which the trees of such a forest are forced to maintain in combination with other plant forms.

The ohia lehua, which is the chief tree in our protection for-

ests, is a tree of pronounced intolerance, that is, it is not able to grow in shade. This is indicated by the thin, upright, scraggly crowns of this tree and by the fact that one never sees a healthy ohia lehua growing in the shade of other trees. For its best development the tree demands full sunlight from the time the seed germinates until it reaches maturity.

The ohia lehua, moreover, bears in enormous quantities minute seeds which are very light and are carried to great distances by the wind. On a new lava flow, where moisture conditions are favorable, this seed lodges in the woolly scales of ferns, which, owing to their fine spores, are first to establish themselves on such situations. Later on, when the stand of ohia lehua has established itself and succeeded the smaller ferns, a new condition arises. The presence of the trees produces shade which fosters moisture. Organic material from the trees in the form of leaves and dead branches drop to the ground and develop humus which, in combination with the disintegrated lava, broken up by the roots of the trees, produces a soil in which shade enduring tree ferns then appear.

When the older ohia trees reach maturity they must necessarily reproduce themselves from seed and in order to do this in the presence of such an undergrowth, they have adopted the remarkable habit of using the tree ferns, other plant growth, and fallen trees, in fact, any place where the seed can be exposed to the sunlight, as a germinating bed. Wherever such places of lodgment for the seed present light conditions which are adequate for germination, we find the young plant sending its roots down the host tree to the ground where they then perform the normal functions of support and nutrition. These roots gradually become larger and larger until the tree is entirely independent of its nurse and in the process of time the host plant finally decays and the tree is left standing on these stilt-like roots, which to all appearances are simply divisions of the trunk. Thus the tree ferns and other undergrowth act in cooperation with the upper story of trees by protecting the shallow-rooted system of the tree and serving as a germinating bed. It is only in this complicated manner that the ohia lehua, a tree of such pronounced intolerance, can reproduce itself in the wet, dark forest generation after generation.

The seed of this tree is most difficult to germinate artificially and the seedlings are of slow growth and not readily handled in the nursery. For these reasons, it is not a satisfactory species to use in artificial reforestation. Moreover, the forester must rely as far as possible for the sake of economy on the natural reproduction of the forest.

For the continuance and perpetuation of the ohia forest we must, therefore, depend largely upon natural methods, methods which are well-nigh impossible to replace by artificial means, but in order to perpetuate the natural methods we must give every assistance by affording the forest absolute protection.

*Susceptibility of the Native Forest.*

Let us now see what happens when cattle have access to the wet native forest. The animals will first attack the most toothsome plants such as the ti leaf and ie ie vine around the outer edges of the forest. Then they will work further in, destroying the ferns and undergrowth not only by browsing and tearing them up but also by trampling on them. The ground cover will thus be removed and will disappear, the forest floor dry out, and what was once boggy ground will, with the admission of the sunlight, gradually become firm and hard. From year to year, the stock will work further back, thus increasing the zone of forest deterioration.

With the protective covering of the shallow roots of the trees thus removed, the plant association is broken up, and the trees are left alone to struggle for their existence. It is a mistake to assume that if the trees themselves are not destroyed or disturbed the forest will continue in its virgin state. With the root systems left thus unprotected, there will be a gradual dying off of the weakened trees. The loss in numbers of weakened trees will admit still more sunlight to the undergrowth, or what is left of it, than it has been accustomed to and the consequence is its further disappearance, which in turn increases unfavorable ground conditions, with the further reactional effect on the trees. With the damage once started, the mischief is done and it is a mistake again to suppose that the grazing of a few head of cattle in the forest for a short time will not result in any damage.

With the deterioration once started, the opportunity is presented for the attack of insect pests and fungus diseases and the introduction of more rapidly growing plants and weeds which will completely occupy the exposed ground and prevent the natural reproduction of the native trees.

These changes will go on until finally the once dark, wet forest composed of trees, vines, ferns, undergrowth and moss, a combination ideal for preventing excessive runoff and keeping the soil porous so as to increase subsurface percolation, will disappear and in its place we will have a barren, open, useless waste, inoperative as to water conservation and often covered with Hilo grass, with perhaps here and there a few dead trees to testify of what once occupied the land in a useful capacity.

*Forest Protection Necessary.*

The importance of keeping the native forest intact cannot be over-emphasized, because injury done by one agency, although slight, may simply pave the way for other far more destructive agencies. The native forest, when given absolute protection and allowed to remain in its virgin condition, is not generally subject to attack by injurious insects or diseases. Not only must beasts be kept out of it, but man also, as far as is possible, because



the entrance of human beings into the forest, no matter how unintentional, cannot but give adverse results. To cite only one example: Hilo grass seed carried into the forest from the outside on a man's wet trousers or shoes will be dropped and will germinate in small openings in the forest or along a trail and will spread to the great detriment of the undergrowth.

### *Economy in Forest Protection.*

The economical aspect of forest protection should not be neglected. It is much cheaper to protect what we have in the shape of a water-conserving forest than to ignore it entirely and hereafter be compelled to reforest by artificial means.

When taken at the start, at the very beginning of deterioration, the native forest when protected by suitable fencing to keep out stock, will often recover to a degree sufficient to perform the functions of conserving water. The later this protection is given, however, the more difficult will it be for the forest to come back, especially if foreign growths have been allowed an entrance. It pays therefore to tackle the problem at the very beginning of trouble, or better still, before the trouble begins.

If deterioration has been complete, the job of artificial reforestation is most difficult. To be sure, the native koa tree can be used for this purpose to some extent in certain situations, such as well-drained soils, where there is a moderate amount of moisture. The koa is easily handled in the nursery and gives quick results in the way of growth, but its extensive use is hindered by the difficulty of securing an abundance of seeds because of a destructive moth borer which attacks the seed pods while they are ripening.

The difficulty of establishing an ohia lehua forest by artificial methods of planting has already been explained. It has been attempted also to point out the complicated evolution of our wet forest, the peculiar method by which it perpetuates itself, and the intricate natural association of plants in such a forest, which serves as an ideal protection forest. To allow such a natural forest to disappear and attempt to replace it generally with a new forest, established by artificial means, seems almost like flying in the face of Providence.

Artificial reforestation is at best a very expensive undertaking and a great deal of experimentation would first have to be undergone before one could find the happy combination of self-perpetuating trees, shrubs, and undergrowth which would live together and thrive under the peculiar conditions found in our mountains and perform the function of conserving the runoff in a better and more satisfactory manner than our present native forest.

In some situations, where on account of poor drainage or worn-out soils our native tree species will no longer thrive, they may have to be replaced with more vigorous introduced trees. With



such trees must be secured a suitable undergrowth which will combine as a whole and produce a satisfactory protection forest. This is a problem which must be worked out experimentally at some cost on a small but positive scale and brought to a satisfactory conclusion before it is attempted very extensively.

The chief enemy of the native forest today is the bullock, and the sooner he is removed from and kept out of the forest, the sooner will we receive in fuller measure the benefits to be derived from a protection forest.

### *Fire Danger.*

Fortunately we are usually blessed with such an abundance of rain in our heavily forested regions that the menace of forest fires is not as a rule very great. Occasionally after one of the long droughts, which are not unknown here, the forest will dry out to such an extent that the fire danger will be serious, and if a fire does occur it will do irreparable damage.

The serious aspect of a forest fire in our woods is the fact that the fire will travel underground through root channels or in the dry duff and, reappearing again on the surface in the form of a smouldering spark, will be fanned into flame, and will again sweep over the surface.

The only way to overcome this is to trench completely around the burning area down to mineral soil.

Fires not only damage or kill outright living trees but prepare the way for insect and fungus attack and for the introduction of introduced and undesirable plants such as the staghorn fern.

### *Complete Protection Needed.*

For the production of an adequate and constant supply of water from our native protection forests, we must therefore give them the completest protection that is within our power. This is particularly necessary on account of their peculiar susceptibility to injuries.

This protection is absolutely necessary not only for the present, when we occasionally feel the need of an adequate supply of water, but will be much more so in the future when the islands will be more thickly populated and water will be in still greater demand.

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## III. METHODS OF FOREST PROTECTION.

### *Threefold Damage.*

Our mountain forest is threatened by many enemies and must be protected against preventable damages. These may be grouped together under three main heads: 1. Damage by Man. 2. Damage by Fire. 3. Damage by Animals.

*Damage By Man.*

In carrying out ways and means of preventing damage to our protection forest as caused by man, it is essential that the boundaries of the forest lands that are to be given protection, be definitely marked by permanent monuments so that the limits of the protected area may at once be recognized on being approached by anyone. This may be done in a variety of ways.

Where it is necessary to fence the boundaries to keep out stock, the fence itself with explanatory signs will be sufficient. Where natural barriers occur and fences are not necessary, it is customary for the Division of Forestry to place permanent monuments at salient points. These may be either a plain pipe set in the ground or a standard forest reserve monument which is easily recognizable.

Timber cutting in our wet native forests is detrimental for reasons already explained and should not be allowed. It is justified only in very exceptional cases, such as when fence posts are needed for boundary fences and it is out of the question to obtain them from elsewhere.

*Rule II.*

For the guidance of public conduct on government lands within the forest reserves a general rule has been established and makes clear just what is not allowed on such lands.

This is called Rule II of the Division of Forestry which was adopted by the Board of Agriculture and Forestry and approved by the Governor on April 5, 1916. It covers the protection and administration of forest reserve lands and was prepared after a careful study of the necessary points to be covered. It is largely based on the regulations of the U. S. Forest Service, which have been successfully tried out for many years on the 150 million acres of land in the National Forests of the mainland.

Rule II is as follows:

## TERRITORY OF HAWAII.

## BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.

## RULE II. DIVISION OF FORESTRY.

The Board of Commissioners of Agriculture and Forestry hereby makes the following rule and regulation for the preservation and administration of forest reserves:

Section 1. The following acts are hereby forbidden on government lands in forest reserves of the Territory of Hawaii and declared to constitute trespass punishable by fine:

(a) The cutting, killing, destroying, girdling, chopping, injuring or otherwise damaging, or the removal, of any timber, young tree growth, or any material, except as authorized by permit from the Superintendent of Forestry.

(b) The grazing of any livestock, except as authorized by permit from the Superintendent of Forestry.

(c) The hunting of any wild animals, except as authorized by permit from the Superintendent of Forestry.

(d) Having or leaving in an exposed or insanitary condition camp refuse or debris of any description, or depositing or being or going thereon and depositing in the streams or other waters within or bordering upon government lands in the forest reserves any substance or substances which pollute or are liable to cause pollution of the said streams or waters.

(e) The going on or being upon government lands within a forest reserve with intent to destroy, molest, disturb, or injure property belonging to the Territory of Hawaii, or used by the Territory of Hawaii in the administration of the forest reserves.

(f) The wilful tearing down, defacing, or disturbing of any public notice or survey monument posted within a forest reserve.

(g) Squatting upon government land in a forest reserve, or constructing or maintaining any kind of works, structure, fence, inclosure, road or trail, without a permit, except as otherwise allowed by law.

(h) The tearing down, breaking down or through, or molesting in any manner of a forest reserve boundary fence or gate or a fence or gate on government land within a forest reserve.

Section 2. Any person violating the above rule shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to exceed five hundred dollars (\$500.00), as provided by Section 529, Revised Laws of Hawaii of 1915.

Section 3. This rule shall take effect upon its approval by the Governor.

Approved:

LUCIUS E. PINKHAM,  
Governor.

Honolulu, Territory of Hawaii,  
April 5, 1916.

All rules and regulations of this Board have the force and effect of law.

Rule II has so far proved very satisfactory and many arrests and convictions have been made for infringements of several of its provisions.

### *Timber Cutting.*

The portion of it relating to the cutting or killing of trees has moreover been strengthened by Act 83 of the Session Laws of 1919, which reads as follows:

"SEC. 1. The cutting, killing, destroying, girdling, chopping, injuring, or otherwise damaging, or the removal of any timber, young tree growth, or products of tree growth on lands in the forest reservations belonging to the Territory of Hawaii, except as authorized by law or by permission from the Superintendent of Forestry or his agents, is hereby prohibited.

"SEC. 2. Any person who shall violate any of the provisions of this Act shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by imprisonment not more than one year, or by a fine of not exceeding one hundred dollars."

*Proclamation of Forest Reserves.*

The value of the native forest for the conservation of water was early realized by some prudent land owners who wisely attempted to protect them from damage by man and the inroads of stock by constructing suitable fences and preventing trespass. Those who did this are now reaping the benefits of possessing forests which are in splendid shape.

While tree planting was undertaken by the government of these islands as far back as 1882, it was not until 1903 that the first legislation was passed which provided for a Board of Agriculture and Forestry consisting of five commissioners and authorized them to recommend the creation of forest reserves to be set aside by proclamation of the Governor. Since this time the government has taken the lead in forest matters. Naturally, the first work was to examine and describe the lands to be set aside, a most arduous task, and the proclamation of the general forest reserve system begun on November 10, 1904, when the first reserve was set aside, was completed in December, 1918. This demarcation of forest lands was a huge job, for it was scattered over the five main islands and involved a large amount of examination on the ground and definite surveys of boundaries.

In describing such reserves, it has been the policy from the start not to include, if possible, lands which are more valuable for agricultural purposes and to strike an even balance with the stockman by not including in the reserves any more land than was necessary when viewed in the light of the absolute needs of water conservation and the proper use of adjacent lands.

The result has been the establishment of a forest reserve system on the five main islands totalling 818,739 acres as follows:

*Table of Forest Reserves.*

	No. of Reserves.	Govt. land acres.	Private land acres	Total acres.	Per cent.
Kauai.....	8	81,325	66,888	148,213	18
Oahu.....	15	34,045	33,888	67,933	8
Molokai.....	1	13,268	31,406	44,674	6
Maui.....	7	74,980	46,148	121,128	15
Hawaii.....	16	355,037	81,754	436,791	53
	47	558,655	260,084	818,739	100
		68%	32%		

*Lands in Reserves.*

Most of the reserves embrace watersheds and mountain tops where it is essential for the conservation of water that the forest cover be protected and maintained and also potential forest lands adjacent to heavy forests which have been denuded of



trees and which must in time be planted up to give the native forest the necessary protection in the nature of a shelter belt.

### *Modification of Reserves.*

Where the land belongs to the government, it is definitely set aside and while so set apart cannot be leased or sold by the government or used in any way for any purposes which are inconsistent with the forest laws. Lands may be withdrawn by proclamation after the required public hearing. In some places there may still be small areas which it is advisable to eliminate from present reserves, where the description, being prepared hastily, runs from peak to peak and includes lands which are not required for forest protection, and are more valuable for other purposes.

In other places there are small areas of land, such as abandoned homesteads in the forest where the raising of crops has been unsuccessful, which should be added to the present forest reserves. Where the reserve boundaries cross privately owned lands, the proclamation does not affect the status of the land but is merely a recommendation that such land be treated and cared for as a forest reserve.

### *Surrender of Forest Lands.*

There is a provision in the law (Sec. 490), whereby private land, whether held under lease or in fee, may be surrendered to the care, custody and control of the government as a forest reserve for one or more years or forever. No taxes shall be levied or collected upon any private lands so surrendered for such a purpose so long as the same remains exclusively under the control of the government as a forest reservation.

Advantage has been taken of this law to the extent of surrendering 12,739 acres for a term of 17 years in one case, and in another about 120 acres was surrendered for a term of five years.

Where the government land in a proclaimed forest reserve is still under lease, the forest reservation does not take effect until the expiration of the lease.

### *Cooperation Necessary.*

On account of our peculiar system of land boundaries, the variously owned lands usually running in strips from the sea up to the mountains, it is obviously necessary that there be close cooperation between the government and private owners, or between private owners of such forest reserve lands in their management, if general benefits are to be derived. In other words, the lands should be treated as if they were under one ownership so that boundary fences may be continuous across private as well as government lands and so that resulting benefits from forest protection may be universal within the whole forest reserve.

The desired and effective end is a continuous stretch of protection forest where it is needed, rather than isolated sections of merely government-owned forest lands.

Many private owners of such lands have worked toward this end in a gratifying manner and it is expected that the execution of the plans of the new Division of Forestry of the Hawaiian Sugar Planters' Association in cooperation with the territorial government will greatly further the ultimate unification of all lands in forest reserves.

### *Damage by Fire.*

It has already been pointed out that fortunately, as a rule, the fire danger in our native protection forest is not great on account of the usual abundance of rainfall. This is all the more reason, therefore, why we should constantly be on the watch for fires and prevent the occurrence of any, because of the great damage they do whenever they get started.

There is provision in the laws of the Territory for a general forest fire service which covers not only lands in forest reserves or only government lands, but applies to all lands. This is based on the California law and provides for a system of voluntary fire wardens, whose duty it is to report and suppress all fires. There are 55 of such appointed wardens throughout the Territory and they have done very effective service in controlling fires in their respective districts. These wardens have the authority to compel all able-bodied male persons, between the ages of 16 and 50 years, to assist in putting out fires.

The law also provides a penalty of from \$25 to \$5000 for the setting of fires and that in times and localities of particular fire danger the Superintendent of Forestry, who is ex-officio Chief Fire Warden, may specify that no fires to clear land may be set without first obtaining a burning permit.

The cause of forest fires is usually carelessness or thoughtlessness and the people must be educated up to the necessity of care with fire in dangerous regions. The smoking out of bees from a bee tree is the frequent cause of fires and is prohibited on government lands. Fortunately, lightning, which is the cause of the starting of 17.5% of the forest fires in the United States, is not a menace here because of the infrequency of electric storms in these islands.

To keep the fire danger constantly in the minds of the people, cloth fire warnings are posted in conspicuous places and whenever sufficient evidence can be secured the party guilty of starting a fire is brought to justice.

### *Damage by Animals.*

The greatest common damage done to our native forests is caused by unrestrained cattle, by horses to a small extent, and by wild goats.

### *Fencing Necessary.*

It is not reasonable to expect that a cow brute will recognize a forest reserve monument or a boundary notice, and of her own free will keep out of a forest reserve. It is therefore absolutely essential to fence a forest reserve boundary whenever there is a possibility that cattle may cross the line and get into the forest that requires protection. It is not merely necessary that a meager barrier be erected but quite positively essential that an absolutely stock-proof fence be constructed and that it be maintained constantly in good repair so that it is always effective in turning stock.

A hungry animal will put forth great efforts to get through a fence when there is luscious feed on the other side or a large bull traveling at great speed will not stop short of anything in the way of a barrier that is not absolutely stock proof. The importance therefore of building fences that are effective can not be over-emphasized and, like a chain, the strength of a fence will lie in its weakest stretch.

### *Character of Fences.*

The Division of Forestry has adopted a standard fence which consists of 7-foot redwood posts set 2 feet in the ground 20 feet apart. To these are attached five No. 6 specially heavily galvanized smooth wires which are stretched by three intermediate Douglas fir spreaders. Up until recently, when costs have advanced so enormously, such a fence could be built in an average mountainous situation for \$500 per mile.

On parts of Hawaii where posts of native woods are abundant it is customary to use posts of large diameter and set them 8 feet apart in the fence line without the use of spreaders. In some places the Division of Forestry has been using concrete fence posts on account of their greater durability, but it has been found that in wet ground they do not hold up as well as wooden posts of greater diameter. In all fence building it is very advisable to use the most durable wire obtainable, for a little extra expense at the start will more than cover the cost and labor of replacement later on.

### *Fences Built.*

Up to 1904, when the Division of Forestry began active work, over 200 miles of fences had been constructed by private parties to protect forest lands. During the 14 years since the setting apart of the first government forest reserve up to the end of 1918, through the efforts of the Division of Forestry, by cooperation with private owners and by fencing clauses in leases of government grazing lands, 42 miles of new fences have

been constructed and 18 miles of old fences have been repaired, making a total of 60 miles of forest reserve boundary made impassable to stock. This work is progressing as rapidly as funds and opportunity permit. The repairing of existing fences and keeping them in stock-proof condition is just as important as the construction of new fences on forest reserve boundaries.

### *Exclusion of Stock.*

The laws of Hawaii prescribe, among other things relating to forestry, that it is the duty of the Board of Agriculture and Forestry "to secure as speedily as possible, either by private cooperation or by public appropriation, the erection and maintenance of fences to exclude live stock from forest reservations, and the removal from such reservations of the live stock running thereon, including the killing the same, if necessary." To this the last legislature added:

"When branded wild cattle are found on any such forest land in the Territory, which land is fenced and duly set apart and established as a forest reservation, the owner or lessee of such land, if such land be privately owned, and the agents of the Board of Agriculture and Forestry, in all cases where the land is so set apart and established as a forest reservation, whether from privately owned lands or public lands, may remove, shoot, or destroy such cattle without compensation to the owner, after sixty days' public notice, ten insertions, of such intended action has been given by publication in a newspaper of general circulation in the county or city and county where such cattle are found."

Much has been accomplished toward the exclusion of stock from the reserves and it is likely that this latest provision will soon be put into effect. From May 1917 to date, the period during which records have been kept, there have been removed from or killed on forest reservations by those holding hunting permits from the Superintendent of Forestry, a total of 1,097 wild animals, which include 233 goats, 311 cattle, and 553 pigs. This is only a portion of the number actually removed, for it is difficult to get all hunters to report their bags.

The removal of cattle from the reserves is usually left to the adjacent ranchers, for they often have some claim to their original ownership and are also better equipped for the purpose.

### *Forest Extension.*

The most important and chief forest work in this Territory is, therefore, forest protection, giving the native forest absolute protection by preventing damage caused by man and beast. When all of our protection forests are properly fenced and further inroads of stock have been prevented we shall have advanced a long way toward the desired end. Your cooperation in report-



ing to the Board of Agriculture and Forestry areas that are in need of protection will be greatly appreciated, for much remains to be done in this direction.

When this protection has been accomplished attention will then have to be directed to areas within the reserves which have been so severely damaged that they will not come back into forest unaided. Where the native forest, on account of a heavy ground cover of foreign grasses or plants, will not reproduce itself naturally, artificial reforestation will probably have to be resorted to. The problem of what species to use and how to go about it will vary greatly in different localities, depending largely on soil and moisture conditions and a great deal of experimentation must first take place before the cheapest and most satisfactory methods are determined.

It has already been pointed out that the native koa is a satisfactory tree to handle in the nursery and is suitable for reforestation projects in certain situations where soil and drainage conditions meet its requirements.

The trees which have been tried out and found to be entirely suitable for extensive use in reforesting our wetter forest regions are very few. A lot of new work in this line lies before us. Trees such as those of the genus eucalyptus are not ideal for this purpose because they demand a great deal of the soil and also, as a rule, prevent a desirable undergrowth from coming up in their shade. Yet, it is likely that introduced species must be relied upon for use in building up parts of our depleted forests, because such trees will take hold more quickly and may give better results than native species. It is very desirable to secure trees which will seed freely and be able to reproduce themselves naturally. In the drier portion of the Kauai mountain plateau at Halemanu, the introduced karaka tree from New Zealand has become established and seems to be a type of tree suitable for our purpose, for it forms a good growth and reproduces itself freely. Both the government and the H. S. P. A. are now working on the problem and are hopeful of good results, although the work will necessarily require a long period of time.

In all such reforestation work it must be kept in mind that the desired end is to secure a combination of trees and undergrowth which will form a ground cover which will serve efficiently in preventing excess runoff and keep the soil porous so that surface drainage will be converted to sub-surface percolation.

In the drier regions or on the outskirts of our forest where protection against strong winds is desired, the fast-growing eucalyptus are suitable for planting and give satisfactory results.

In all of such plantings, however, where protection against excessive winds and a permanent ground cover are desired, no thought must be given to the use of such established forests as supply forests. They must be retained strictly as protection forests and no cutting should be allowed in them.

*Supply Forests.*

For the production of fuel wood and smaller forest products such as posts and poles, as well as the production of trees for lumber, lands, preferably in accessible regions near the point where the products are to be used, should be definitely set aside for the purpose. Many of the sugar plantations have already realized the value of a cheap supply of fuel wood and have established extensive tree plantations from which they are now harvesting annual crops of wood. Such work is simple and brings such good results that every foot of waste land, as, for example, gulch sides and odd corners, should be utilized and devoted to this purpose.

For the production of larger timber trees, better soils will be required, but not often can they be spared for this purpose. Moreover, a longer investment is necessary for such a product.

It is my opinion that good lumber can be produced in these islands, by those who are willing to wait for it, by planting selected timber trees which have been proved suitable to this purpose in similar latitudes and situations. Among such trees are the kauri pine of New Zealand, the several species of *araucaria* which produce soft wood of good construction value, and the Australian red cedar of Queensland and New South Wales, all of which grow well in our climate.

A point to be emphasized in all tree planting, however, is to give the planted trees adequate care during the early growing period by frequent weeding and clearing, for it is not the number of trees which are actually set out that counts, but the number of trees which through constant care and cultivation are brought to such a state that their growth will no longer be hindered by rank grasses and weeds.

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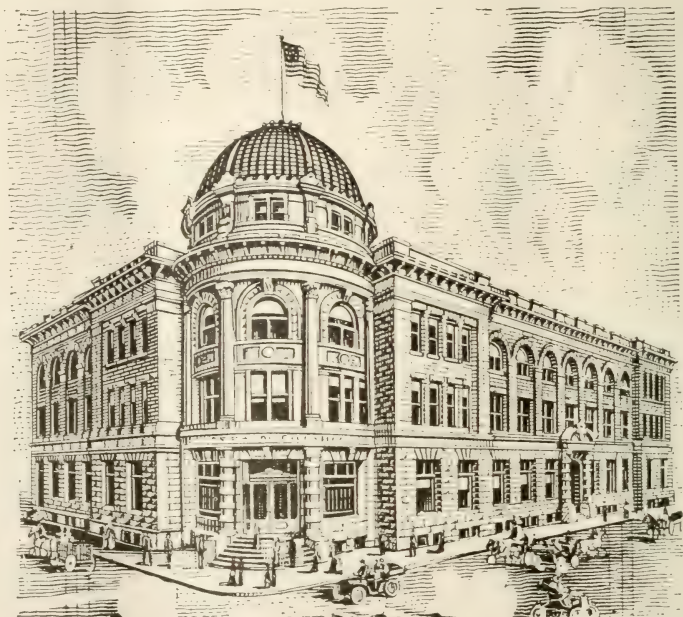
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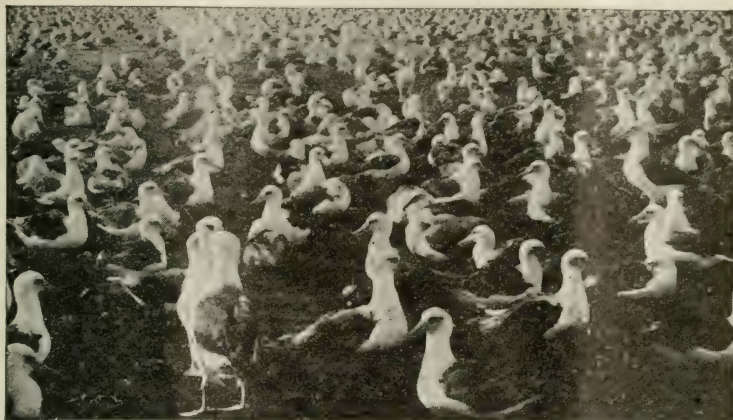
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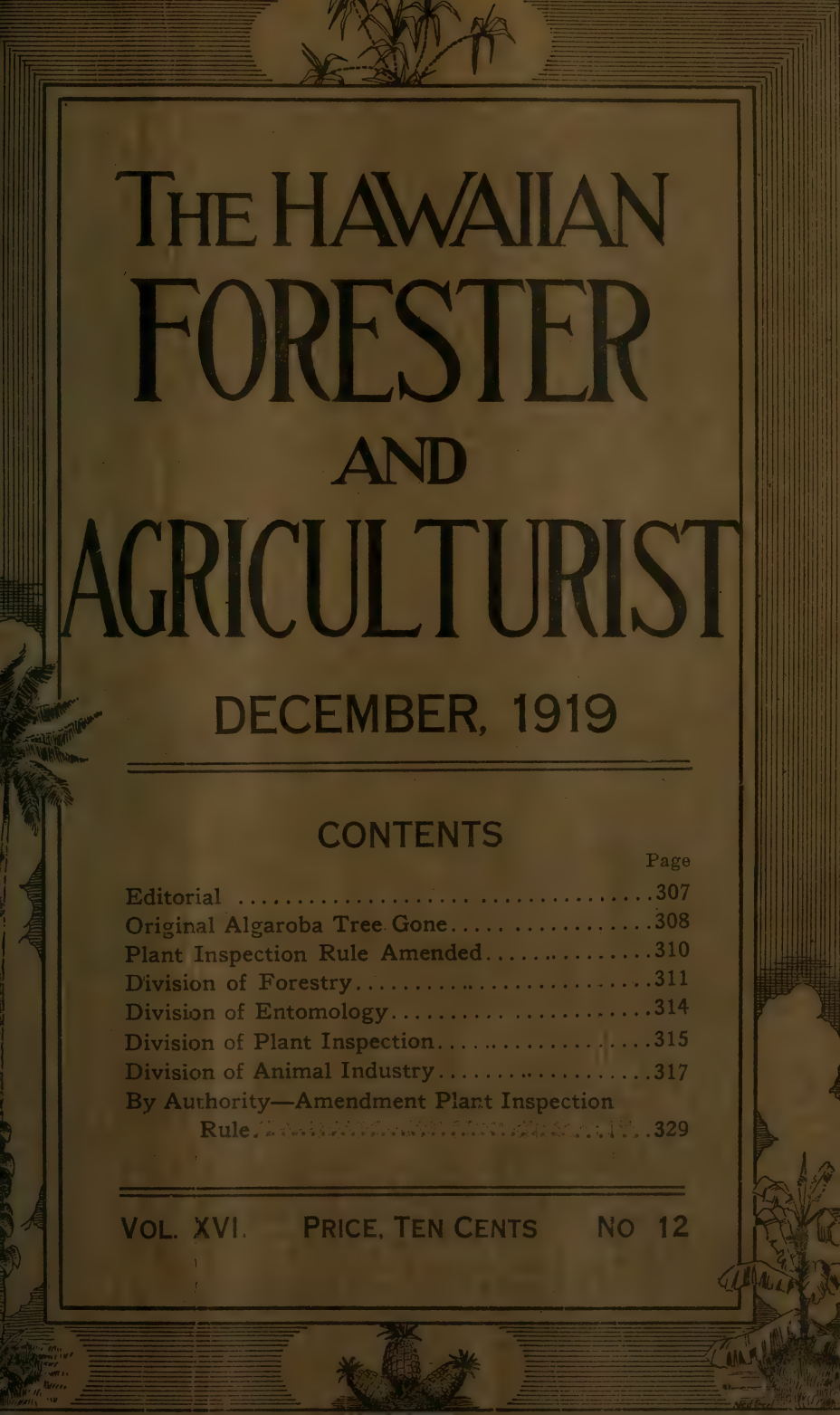
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# THE HAWAIIAN FORESTER AND AGRICULTURIST

DECEMBER, 1919

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The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale, the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter, always write your name and address in the upper left-hand corner of the package. Address all communications, DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

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# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XVI.

HONOLULU, DECEMBER, 1919.

No. 12

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Many new tree species, not generally planted out, are now being used by the Division of Forestry in reforestation projects.

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Ranchers and stock breeders will be glad to have for reference the list of awards for livestock entries at the second annual Maui County Fair, printed in this issue.

---

Dr. A. R. Rowat has been reappointed Deputy Territorial Veterinarian for West Hawaii, and on December 1 assumed duty, with headquarters at Kohala.

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Arbor Day was celebrated on November 21, by appropriate exercises in the public schools. As usual, a supply of trees was distributed from the Government Nursery for planting on this day.

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It is hoped that within four months we shall be enjoying fresh apples from New Zealand, as a result of the amendment to Rule I of the Division of Plant Inspection.

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The Forest Nurseryman is now raising young Australian red cedar trees from seed obtained from trees of this species, *Cedrela australis*, growing at Kunia, Oahu, which are only seven years old.

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Word has recently been received from Washington that this Territory has at last been admitted to share in the federal appropriation for the indemnification of owners of condemned tuberculous animals. The U. S. Department of Agriculture will pay one-third of the indemnities, within certain limitations.

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An exception has been made in carrying out the policy concerning bird sanctuaries in forest reserves, as set forth in the August Forester, by allowing the hunting of cock pheasants on government lands in the Kula Forest Reserve, Maui, only. The reasons for this exception are given in the current report of the Superintendent of Forestry.



## Original Algaroba Tree Gone

---

All sympathetic Honolulu residents were sorry to see the passing away on October 23, 1919, of the original algaroba tree, the parent tree of historic interest which for 91 years had stood, in the Catholic Mission grounds on Fort Street, as a monument to the memory of Father Bachelot, who planted it there in December, 1828.



The Original Algaroba Tree in Hawaii

During the youthful days of Honolulu, this algaroba tree, *Prosopis juliflora*, stood forth in all its glory, surrounded by many of its progeny, especially across the street in the old Fort Street Church yard. But with the erection of the Fred Harrison block in 1906, the tree was severely topped to make room for this city improvement, and lately the demand for building space of greatly increased value and the uncertainty of how much longer

the old tree, in its weakened condition, would last, it finally had to make way for the new Knights of Columbus building, "and the place thereof shall know it no more."

Perhaps no other tree the world over has had such a remarkable history or has been responsible for greater benefits than this original algaroba, for from it by the assistance of stock there has been established, on the lee shores throughout these islands, forests which now cover approximately 90,000 acres of what used to be barren lands, but which by reason of this tree now produce an annual crop of about 30,000 cords of excellent fuel wood,



The Last of the Original Algaroba.

over \$160,000 worth of honey, and an enormous yield of beans, which furnish a valuable fattening food for stock at a time when the long, dry summer has exhausted the grass supply.

On account of the economic position which it holds in the island flora and the blessings which the original tree, now gone, has showered on the inhabitants of this Territory (aside from the native forest trees which conserve our moisture), the algaroba tree has well earned its place today as the most valuable tree in Hawaii.

C. S. J.

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## Plant Inspection Rule Amended

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Rule I of the Division of Plant Inspection, originally approved on October 25, 1904, and approved with amendments on June 8, 1918, was on October 21, 1919, further amended by the Board of Agriculture and Forestry and received the approval of the Governor on October 31, 1919.

The purpose of this last amendment was twofold:

1. Section 1, which prohibits in general the importing of fresh fruit into the Territory from certain foreign countries on account of the introduction of fruit flies and other insects, was amended to permit the importation of fresh apples from New Zealand under certain conditions. Mr. Adolph Moritzson of Dunedin, New Zealand, recently brought to the attention of the Board the advisability of allowing fresh apples to be imported from New Zealand, pointing out that there were no fruit flies or other injurious insects in New Zealand which would endanger the Hawaiian crops and which could come on such shipments, that the apples would come in cold storage, not in contact with any other fruit, and that they would reach the Honolulu market from February to July, during the off shipment of California fruit. This section was, therefore, amended so as to permit the importation of fresh apples from New Zealand in cold storage only, provided they are free from insects and plant diseases and are accompanied by government certificates that the apples have been grown in New Zealand, are shipped free from pests and diseases, and have not and will not come in contact with Australian grown fruit on the voyage to Hawaii.

2. Section 2, which governed the importation and inspection of plants, seeds, etc., from foreign countries, was radically changed and made more restrictive, in order to keep abreast of the times and to conform with the regulations of quarantine No. 37 of the Federal Horticultural Board. The object of this amendment is to keep out soil, succulent plants, or any other plants and parts of plants which are likely to harbor injurious insects and plant pests, which must be kept out of this Territory.

Rule I of the Division of Plant Inspection, as recently amended, appears on the By Authority pages of this number.

## Division of Forestry

Honolulu, Hawaii, November 13, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of October, 1919:

### TREE PLANTING.

Tree planting was continued during the month on three forest reserves where showers assured successful planting. While only a total of 1875 trees were set out, a variety of species was used for the most part in order to determine their adaptability to the regions. At Mikilua, in the Waianae Mountains, in the arid section, 1031 bloodwood, *Eucalyptus corymbosa*, 108 logwood, 327 ironwood, and 40 monkey pod trees were planted, while at Waiahole, Oahu, in a moister region, 65 molave, 17 *Brassaia actinophylla* of the Aralia family, 27 red sandalwood, *Adenanthera pavonia*, 35 wood oil trees, *Aleurites Fordii*, and 25 camphor trees were set out. At the Papapahalahola Spring Reserve, Kauai, 200 swamp mahogany were planted. Several hundred Norfolk Island pine, kauri pine and Japanese cedar trees were also sent over to Waiahole in seed boxes to be transplanted into tins preliminary to final planting.

Consulting Botanist J. F. Rock returned during the month from his trip to Java and the Orient, bringing with him a quantity of seed of *Albizzia montana*, which he recommends for planting in the mamani type on our higher mountains.

Forest Ranger Hardy sent in a bag of karaka seed from Halemanu, Kauai, which has been divided with the H. S. P. A. for reforestation purposes.

A supply of tins has been sent to Ranger Aguiar at the Animal Quarantine Station, Hilo, for use in raising kauri pine transplants, which will soon be shipped up to him packed in moss, and which will eventually be set out on the enlarged boundaries of the station.

### FOREST PROTECTION.

No forest fires were reported during October, although in some regions dry conditions still obtained.

During the month .38 mile of the boundary fence around the Papapahalahola Spring Reserve, Kauai, was repaired and put in good shape, and in Sec. C. of the Olaa Forest Park Reserve .28 mile of new fence was constructed near 18 Miles in cooperation with Mr. Jos. Zembik.

Forest Ranger Charles E. Stone began his duties on October 6, and is engaged in his principal work of looking after the fences on the boundaries of the Kau Forest Reserve, Hawaii. He reports that he has found the fences in good repair, as far as he has inspected.

On October 9, two Japanese, who had been arrested for cutting grass near No. 2 reservoir in Nuuanu Valley in violation of Rule III of this division, pleaded guilty and were each given a suspended sentence of 13 months.

An application for permission to graze cattle in the Kula Forest Reserve, Maui, because of the shortage of feed, was refused in conformance with the policy of the Board recently established in connection with a similar application in the Lualualei Reserve.

### PERMITS.

After designating the location on the ground, on October 29, I issued a permit, as authorized at the Board meeting of October 21, to Mr. W.



E. Wall to erect a water tank on the Honolulu Watershed Forest Reserve on the Tantalus ridge back of the Makiki Heights lots.

On October 27, after President Rice and Captain Woodward and I had inspected the cinder pit in the Round Top Forest Reserve, I issued a permit, at the direction of the President, to the Constructing Quartermaster to remove 100 loads of cinders, which were badly needed for road building at Fort Armstrong. Further developments in connection with this use have been made the subject of a special report.

#### PHEASANT HUNTING IN KULA RESERVE.

In August a new policy was established of not issuing permits for hunting game birds on government lands in the forest reserves so that such birds could have a place for breeding unmolested. During October, however, it was pointed out that unless an exception was made for pheasant hunting in the Kula Forest Reserve, an injustice would be done, because the government lands there are practically the only place where the ordinary sportsman may hunt pheasants on Maui. On the advice of the President, I therefore made an exception to this general rule, and on October 27 issued eight hunting permits for cock pheasants only in this reserve.

#### HAWAII TRIP.

During the first week of the month I was on Hawaii with Entomologist Fullaway, inspecting the control work in operation against the Australian fern weevil at 29 Miles, Oloa. A few new infested areas were discovered but were given immediate attention and cleaned up by the gang of special laborers working under Forest Ranger Mackenzie.

#### LECTURES ON FORESTRY.

On October 16, I began fortnightly instruction in forestry at the vocational school for enlisted men at Schofield Barracks, alternating the work with Forest Nurseryman Haughs.

On October 27, 29 and November 1, I lectured on forestry at the short course for plantation men at the College of Hawaii, which was attended by about 75 lunas and others connected with sugar plantations throughout the Territory. The lectures covered the beneficial effects of forests in general, a description of the native Hawaiian forests, their susceptibility and the functions they perform, and the methods of protecting them. These will be published in an early edition of the Forester, so that they will be available to all who are interested in the subject.

Respectfully submitted.

C. S. JUDD,  
Superintendent of Forestry.

---

### REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, October 31, 1919.

Superintendent of Forestry, Honolulu, T. H.

Dear Sir:—I herewith submit a report of the principal work done during the month of October, 1919.

## NURSERY.

## Distribution of Plants—

Sold, pot grown plants.....	66
Gratis, including forest reserves and Government institutions, pot grown plants .....	2743
Total .....	2809

## COLLECTIONS.

Collections on account of plants sold.....	\$ 1.20
Rent of office, Nursery grounds.....	35.00
Total .....	\$36.20

## PLANTATION COMPANIES AND OTHER CORPORATIONS.

Under this heading 1236 pot grown trees were distributed. We have orders on file for 250,000 plants in seed boxes and 10,000 plants in transplant boxes ready to set out. We expect to have all orders filled by the end of January.

## MAKIKI STATION.

Preparations for Arbor Day and work on orders now on file constituted the principal work for the month.

## HONOLULU WATERSHED PLANTING.

The work done on the section lying between Opu and Makiki Main Valleys consisted of making holes for trees, clearing away grass and brush from the trees recently planted, cleaning trails, etc. We have a large number of koa trees at Makiki Station, which we will commence planting in November.

## ADVICE AND ASSISTANCE.

*Maui County Fair:*

At the request of Mr. F. B. Cameron, Manager of Maui Fair, the writer attended the fair and assisted in the judging of the plants and flowers.

*Nursery, Haiku:*

A visit was made to Haiku for the purpose of examining the new nursery just started a few months ago. Mr. James Lindsay is in charge of the nursery and the work is progressing very satisfactorily.

*Castner and Schofield Barracks:*

Four visits were made for the purpose of giving practical instructions in the propagation of forest trees, to the men attending the vocational school. The men were shown: first, how to collect and prepare seed; second, the work of making boxes; third, mixing and pulverizing soil; fourth, sowing seed; fifth, watering and caring for seedlings; and sixth, transplanting into tin cans and boxes. When the trees become large enough, instructions in planting and care of trees will be given.

## WAIALUA AGRICULTURAL COMPANY.

The writer, on October 28th, at the request of Mr. W. W. Goodale, visited and examined the forestry work done by the Waialua Agricultural Company on the lands not suitable for cane growing. During the past five years the Company has planted about 700 acres in trees, using 30 kinds of

eucalyptus and seven other varieties. The work of the tree planting is under the immediate supervision of Mr. Wm. Harpham, who takes great interest in tree planting, and has a thorough knowledge of the work in hand. The trees, with the exception of a very few species, are doing well and making an excellent growth. The work of plowing and preparing the land thoroughly before planting has added, there is no doubt, to the great success obtained. The writer would suggest that other visits be made for the purpose of measuring the different species, and thereby obtaining the average growth of each. The trees have all been planted uniformly in blocks, so that the work of measuring will be simple.

#### *School and Home Garden Contest:*

The writer has again been asked by the management of the "Honolulu Star-Bulletin" to act as judge for the 1920 School and Home Garden Contest.

The writer has made the following number of calls and given advice and assistance otherwise at the request of people in and around the city:

Calls made .....	7
Advice by telephone .....	3
Advice given at Nursery .....	8
Advice given by letter .....	2
	—
Total .....	20

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## Division of Entomology

Honolulu, Hawaii, October 31, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—During the month of October, the insectary handled 28,800 pupae of the melon fly, from which were bred 5018 females and 4070 males, *Opis fletcheri*.

The distribution of parasites was as follows:

#### MELON FLY PARASITE.

##### *Opis fletcheri*.

##### Oahu:

	Females.	Males.
Moiiliili .....	1750	1400
Wahiawa .....	700	600

##### Hawaii:

Hilo .....	60	60
Pepeekeo .....	100	100
Kapoho .....	100	100
Kamuela .....	300	240

## FRUIT FLY PARASITES.

*Diachasma tryoni.*

Oahu:		
Kalihi Valley .....	100	100
Waipahu .....	20	20

Hawaii:		
Kamuela .....	100	100
Hilo .....	20	20
Pepeekeo .....	100	100

*Diachasma fullawayi.*

Oahu:		
Kalihi .....	40	30
Waipahu .....	30	25

Hawaii:		
Hilo .....	10	10

*Opius humilis.*

Oahu:		
Kalihi Valley .....	50	50

Hawaii:		
Pepeekeo .....	50	50

*Tetrastichus giffardianus.*

Oahu:		
Kalihi Valley .....	1700	
Waipahu .....	300	

Hawaii:		
Hilo .....	200	
Pepeekeo .....	400	
Kamuela .....	700	

## CORN LEAF HOPPER PARASITE.

*Paranagrus osborni.*

Oahu:		
Makiki Nursery .....	1000	
Wahiawa .....	600	

Respectfully submitted,

D. T. FULLAWAY,  
Entomologist.

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## Division of Plant Inspection

Honolulu, Hawaii, October 31, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—I respectfully submit my report of the work carried on by the Division of Plant Inspection for the month of October, 1919, as follows:



During the month 64 vessels arrived at the port of Honolulu, 20 of which carried vegetable matter and seven came through the Panama Canal Zone. The following disposal was made of the various shipments:

	Lots.	Packages.
Passed as free from pests.....	926	28,052
Burned .....	92	92
Fumigated .....	271	271
Total Inspected .....	1289	28,415

Of these shipments, 27,841 packages arrived as freight, 176 packages as mail, and 398 packages as baggage.

#### RICE AND BEAN SHIPMENTS.

During the month 14,875 bags of rice and 4193 bags of beans arrived from Japan, and 810 mats of rice from China. All shipments were found free from insect pests.

#### PESTS INTERCEPTED.

Approximately 8866 pieces of baggage belonging to immigrants from foreign countries were examined, from which 30 lots of fruit and 29 lots of vegetables were taken and destroyed.

On October 5th, per S. S. "Korea Maru," one package corn from Japan, in the baggage, was seized as contraband, and destroyed; also a package of fir boughs found in the baggage was burned.

On October 5th, per S. S. "Anyo Maru," a package of rose plants and a package of onions in soil, were seized and destroyed.

On October 14th, per "Nippon Maru," a rose plant in the baggage and a sack of sprouted barley were seized and destroyed. The barley is contraband under Quarantine Order No. 39, Federal Horticultural Board, on account of Flag smut and Take-all diseases.

Two hundred and seventy-eight packages of seeds of forest trees and other shrubs were brought by Mr. J. F. Rock from various places in the Orient, to be used for forest planting by the H. S. P. A. Of these packages, 15 were burned, showing weevil and borer infestation; the rest of the seeds were thoroughly fumigated with carbon bisulphide. Two packages of orchids were in the same shipment, and being without permit were destroyed. One box of cassava roots for the U. S. Experiment Station were fumigated before delivery. A small package of soil in the mail for a Filipino was burned, also a package of bulbs from Japan, being without permit. Two packages of vegetable seeds found in the mail were fumigated as a precaution.

On October 21st, per S. S. "Sonoma," three packages of tree seeds arrived in the mail for Dr. H. L. Lyon, Agent of the Office of Plant Introduction, Washington, D. C. These were fumigated as a precaution.

On October 23rd, per S. S. "Tenyo Maru," two lots of bulbs, one lot of palm seed and a lot of chrysanthemum plants were taken from immigrants from Japan and destroyed. In the mail of this vessel a package of chestnuts brought in as food was fumigated, and a package of ginseng (Panax ginseng) was found and destroyed.

On October 26th, per S. S. "Great Northern," a package of rice seed was found in the mail from Manila. Being prohibited under Quarantine Order No. 39, it was burned.

On October 30th, per S. S. "Ecuador," a package of pili nuts from Manila and a package of vegetable seeds from Japan, infested with weevils, were seized and burned.

## HILO INSPECTION.

Brother M. Newell, Inspector at Hilo, reports the arrival of six steamers at Hilo, and two sailing vessels carrying lumber. Two steamers carried vegetable matter, consisting of 105 lots and 2328 parcels; all were passed as free from insect pests. The "Anyo Maru" arrived direct from Japan, bringing 603 bags of beans and two bags of sesame seed; all were found to be free from pests.

## KAHULUI INSPECTION.

Mr. Will J. Cooper, Inspector at the port of Kahului, reports the arrival of six vessels, of which one, the S. S. "Manoa," brought vegetable matter consisting of 698 packages of fruits and vegetables, all being found to be free from infestation.

## INTER-ISLAND INSPECTION.

Fifty-six steamers plying between Honolulu and other island ports were attended and the following shipments passed as free from pests:

Taro .....	251 packages
Vegetables .....	371 packages
Pineapple shoots .....	6764 bags
Plants .....	147 packages
Fruit .....	178 packages
Grass seed .....	22 bags
Sugar cane .....	2 cases

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Total passed .....7735 packages

Six packages of plants and one package of sugar cane were refused shipment on account of infestation, undesirable soil, and not complying with the regulations.

Respectfully submitted,

E. M. EHRHORN,  
Chief Plant Inspector.

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## Division of Animal Industry

Honolulu, Hawaii, November 15, 1919.

Board of Commissioners of Agriculture and Forestry, Honolulu, T. H.

Gentlemen:—I beg to submit herewith my report on the work of the Division of Animal Industry for the month of October, 1919:

### BOVINE TUBERCULOSIS ERADICATION.

It is gratifying to be at last able to report success in the efforts of this office to secure for the livestock industry of the Territory, and especially for the dairy interests, the benefits contained in the federal agricultural appropriation bill, which benefits, it will be remembered, were withheld from the Territory through the omission in the act as passed by Congress during December, 1918, of the word "territory" in all places where "states, counties or municipalities" were mentioned.

The benefits referred to consist in the payment by the federal Department of Agriculture of one-third of the indemnities, within certain limitations, assumed by the Territory in the reimbursement of owners of

tuberculous cattle killed in accordance with Act 204 of the Session Laws of 1919. The said Act appropriates for this purpose the sum of \$20,000.00. The federal bill provides the sum of \$100,000.00 for the same purpose, but makes it available only in states, counties, municipalities, and now also in territories which cooperate with the federal Department of Agriculture in its efforts to suppress, control and eradicate bovine tuberculosis in the United States. The insertion in this bill of the word "territory" does not in itself admit this Territory to share in the federal appropriation, as the wording of the act makes it optional with the Chief of the federal Bureau of Animal Industry to select the states, counties, etc., which in his discretion he may "invite" to cooperate with his Division of Bovine Tuberculosis Eradication.

As this invitation had not been forthcoming by the end of October, and as it became evident from the "Weekly News Letter" issued by the Department that the demand for cooperation and participation in the federal tuberculosis indemnification had already created a waiting list, the following cablegram was decided upon:

"Honolulu, October 30, 1919.

"Animal Industry, Washington, D. C.

"Since August first have ninety-nine reactors butchered awaiting federal indemnity. Please forward vouchers and forms.

"Sgd. NORGGAARD."

The reply signed by the Chief of the Bureau under even date, October 30, and accompanied by the supply of voucher claims, orders and instructions, were received on the 15th instant, and the said claims are now being prepared.

It is expected that the admission of the Territory to share in the federal appropriation will increase the effectiveness of the territorial tuberculosis indemnification bill (Act 204, Session Laws, 1919) at least 30 per cent, or in other words, will provide in the neighborhood of \$9000.00 additionally with which to fight bovine tuberculosis during the present fiscal period. A copy of the letter above referred to is appended.

## SECOND MAUI COUNTY FAIR.

Four livestock exhibits, including the one under consideration, are credited to the Territory during recent years. At each of these fairs the exhibit of livestock has been one of the leading features, unless, as might be said of the First Maui County Fair, it overshadowed all the other exhibits combined.

While this cannot be said of this exhibit, the fault lies not with the animals shown, but is due to the immense increase in number and size and excellence of all the other exhibits.

The island of Maui has realized that an annual county fair should be something beyond a hastily thrown bunch of tents and sheds, that a carefully gotten together exhibit is worthy of decent housing, and that valuable livestock must not alone be protected against the elements while at the fair, but must be provided such surroundings and facilities as will enhance the points of excellence of each class and afford the individual every opportunity to demonstrate their worth through performance on the track, in the ring or in the milking shed.

Permanent buildings have been or will be provided for all such purposes, agricultural or mechanical, livestock or liberal arts, with a good race track and an excellent grand stand of liberal proportions. And last but not least, the Maui County Fair and Racing Association practically owns the land on which the fair is located.

These assets in connection with the spirit of cooperation shown by all the agricultural and livestock interests of the island, would seem

to insure a bright future for the further development and the regular annual appearance of the Maui County Fair.

*The Horse Show.* The feature of the livestock exhibit was unquestionably the thoroughbred horses and the polo ponies. It is not the aim here to discuss the merits of either classes or individuals, but a perusal of the list of awards and prizes published in this issue of the Forester, will suffice to show that many of the best horses of the islands were present.

Draft horses, especially Percherons, were also well represented and gave promise of a permanent supply of farm and utility animals born and raised locally, instead of imported from abroad.

The *Cattle* and *Swine* were with few exceptions raised or owned on Maui, the difficulties, cost and risk in transporting valuable animals for exhibition on any island except where they have been raised being almost prohibitive.

Among the beef cattle shown must be mentioned the Herefords exhibited by Mr. H. W. Rice and Mr. Sam Baldwin, and the Polled Angus shown by the Grove Ranch, all of which would have been prize winners at any show.

The *Dairy Cattle* were strongly represented only in the Holstein Friesians, but among these there were many excellent animals.

The *Swine* exhibits were about evenly divided between Berkshires and Duroc Jerseys, both breeds being represented by splendid animals, imported as well as home-grown, and nearly all owned on Maui.

The appended list of awards will prove a good index for future breeders and exhibitors.

Respectfully submitted,

VICTOR A. NORGAARD,  
Territorial Veterinarian.

UNITED STATES DEPARTMENT OF AGRICULTURE,  
BUREAU OF ANIMAL INDUSTRY.

Washington, October 30, 1919.

Dr. Victor A. Norgaard, Territorial Veterinarian,  
Division of Animal Industry, Honolulu, Hawaii.

Dear Sir:—Reference is made to your cablegram of October 20, as follows: "Since August first have ninety-nine reactors butchered awaiting federal indemnity. Please forward vouchers and forms."

Under separate cover there is being forwarded to you a supply of the forms necessary in the preparation of claims on account of tuberculous cattle slaughtered; also several copies of B. A. I. Order 267, effective on and after September 1, 1919. This order contains an extract from the law covering the matter of indemnity and you will note that it was approved July 24, 1919, and that it is practically the same as the law for the previous fiscal year, with the exception that the word "territory" is inserted in several places.

The T. E. Form 23 revised is the proper form to use in cases where the cattle were appraised and slaughtered on and after September 1, 1919, but the old T. E. Form 23 and T. E. Forms 25 and 26 should be used in cases where the animals were appraised and slaughtered during the time between July 24 and September 1 of this year. It is necessary to accompany the claim with the T. E. Form in each case, as this shows the amount of salvage received and by whom it was paid. A Department Form 5 voucher is necessary with each claim, prepared in accordance with the sample forwarded to you under date of July 19, 1919.

All information called for on the various forms should be as complete as possible, in order that the claim may be approved and paid promptly.

Very truly yours,

(Signed) J. R. MOHLER,  
Chief of Bureau.



## REPORT OF ASSISTANT VETERINARIAN.

Honolulu, Hawaii, October 31, 1919.

Dr. V. A. Norgaard, Chief Division of Animal Industry,  
Bureau of Agriculture and Forestry, Honolulu, T. H.

Sir:—I beg to submit the following report for October, 1919:

## TUBERCULOSIS CONTROL.

The following dairies were tested during the month:

	Tested.	Passed.	Condemned.
M. S. Teixeira .....	2	2	0
Laie Plantation Co.....	27	27	0
Kahuku Plantation Co.....	7	7	0
O. R. & L. Co.....	39	39	0
Waialeale Industrial School.....	30	30	0
F. S. Lyman.....	71	71	0
Kemoo Farm .....	109	109	0
Karsten Thot .....	37	37	0
J. H. Petersen .....	5	5	0
Antone Martin .....	16	16	0
O. R. & L. Co.....	7	7	0
Y. Ogawa .....	8	8	0
R. Tomita .....	5	5	0
C. M. Cooke.....	9	(one cow held for retest)	
T. E. Robinson.....	1	1	0
O. R. & L. Co.....	8	8	8
Lihue Plantation Co.....	11	11	0

From the above list it will be seen that a total of 392 head of cattle were tested, out of which number one was held for retest.

## IMPORTATIONS OF LIVESTOCK.

During the past month a total of 37 vessels were met and boarded and the following found to carry livestock for this Territory:

S. S. Sachem, San Francisco—12 cts. Poultry, various; 1 dog, Maj. Chas. Barton.

S. S. Manoa, San Francisco—1 ct. rabbits, A. McDuffie; 1 jack, C. Miles, Wailuku, Maui.

S. S. Lurline, San Francisco—5 horses, U. S. Q. M. C.; 10 mares, 30 heifers, 1 cow, 1 calf, Harold Rice; 11 bulls, Lihue Plantation Co.; 8 Shorthorn bulls, O. R. R. & L. Co.; 50 mules, American Factors, Ltd.; 1 dog, Mr. T. Fitzpatrick; 1 dog, Maj. Wheeler; 1 dog, Capt. Famey; 1 dog (owner unknown); 25 cts. poultry, various.

S. S. Mauna Kea, Hilo—1 dog, G. H. Potter (transhipped from the S. S. Enterprise from San Francisco).

Respectfully submitted.

LEONARD N. CASE.

Assistant Territorial Veterinarian.

LIST OF AWARDS  
LIVESTOCK SECTION, SECOND ANNUAL MAUI COUNTY FAIR,  
OCTOBER 9, 10, 11, 1919.

HORSES AND MULES.

**Class A**—Light Animals.

Entry.	Name of Animal.	Exhibitor.	Award.
1. Thorobred Stallion...	Advance Guard II.	Haleakala Rh. Co.	First
	Dinner Bell.....	Angus McPhee.....	Second
	Mort .....	J. H. Raymond....	Third
2. Thorobred broodmare.	Coppit .....	J. C. Fitzgerald...	First
	Florence Roberts.	A. McPhee.....	Second
	Lady Bernice....	W. A. Clark.....	Third
4. Halfbred brood mare.	Hulupala .....	H. W. Rice.....	First
	Brunette .....	L. von Tempsky...	Second
	Dorothy .....	P. W. Eichinger...	Third
5. Thorobred brood mare with foal at foot....	Florence Roberts.	A. McPhee.....	First
	Rosella .....	A. McPhee.....	Second
	Copra .....	J. C. Fitzgerald...	Third
Special prize best foal.....		A. McPhee.....	Special
6. Halfbred brood mare with foal at foot....	Hulupala .....	H. W. Rice.....	First
	Dorothy .....	P. W. Eichinger...	Second
	Brunette .....	L. von Tempsky...	Third
Special prize best foal.....		H. W. Rice.....	Special
8. Colt or filly up to two years .....	Ekela .....	Dwight Baldwin...	First
	Sentinel .....	Foster Robinson...	Second
	Charlie .....	Shiroma .....	Third
9. Colt or filly up to four years .....	Dinner Bell.....	A. McPhee.....	First
	Remark .....	H. C. & S. Co.....	Second
	Peter Post.....	H. W. Rice.....	Third
10. Best thorobred stallion and two brood mares .....		A. McPhee.....	First
		Grove Ranch.....	Second
		H. C. & S. Co.....	Third
11. Champion stallion...	Advance Guard II.	Haleakala Rh.	Champion
12. Champion mare....	Coppit .....	J. C. Fitzgerald...	Champion
14. Champion filly....	Remark .....	H. C. & S. Co.....	Champion
15. Grand champion stallion .....	Advance Guard II.	Haleakala Rh.	Gr. Champ.
16. Grand champion mare .....	Coppit .....	J. C. Fitzgerald...	Gr. Champ.
17. Res. Gr. Champion stallion .....	Dinner Bell.....	A. McPhee.....	Re. Gr. Ch.
18. Res. Gr. champ. mare .....	Remark .....	H. C. & S. Co.....	Re. Gr. Ch.

**Class B**—Draft Animals.

Entry.	Name of Animal.	Exhibitor.	Award.
1. Draft stallion ....	Kingston Monarch.	Grove Ranch.....	First
	Leo .....	H. C. & S. Co.....	Second
	Buster .....	Haleakala Rh.	Third
2. Brood mare .....	Fancy .....	Grove Ranch.....	First
	K2 .....	H. C. & S. Co.....	Second
	2P .....	H. C. & S. Co.....	Third



- |  |   |
|--|---|
| 10. Best four-in-hand<br>mules with turnout..... | Wailuku Sug. Co....First<br>Maui Agr'l Co....Second   |
| 11. Best moldboard<br>team, horses.....          | H. C. & S. Co....First<br>Maui Agr'l Co....Second   |
| 11A Best moldboard<br>team, mules.....           | Wailuku Sug. Co....First<br>Maui Agr'l Co....Second   |
| 12. Best saddle mule,<br>Hawaiian bred.....      | Hameoula.....H. W. Rice.....First<br>Yeo!.....L. K. Smith.....Second<br>Na wai aha.....P. Cockett.....Third |

### CATTLE.

Class D—Aberdeen Angus.

#### BREEDING SECTION.

- | Entry.                       | Name of Animal.  | Exhibitor. | Award. |
|------------------------------|------------------|------------|--------|
| 1. Aged bull.....            | Grove Ranch..... |            | First  |
| 3. Senior yearling bull..... | Grove Ranch..... |            | First  |
| 6. Junior bull calf.....     | Grove Ranch..... |            | First  |
| 7. Aged cow.....             | Grove Ranch..... |            | First  |
| 11. Senior heifer calf.....  | Grove Ranch..... |            | First  |
| 17. Produce of dam.....      | Grove Ranch..... |            | First  |

#### MARKET SECTION.

- |   |                  |       |
|---|------------------|-------|
| 18. Pen of 3 fat steers<br>age limit 3 years..... | Grove Ranch..... | First |
| 22. Fat steer under 2<br>years .....              | Grove Ranch..... | First |

#### CHAMPIONSHIPS.

- |                                   |                  |          |
|-----------------------------------|------------------|----------|
| 31. Champion Fat steer, Jim ..... | Grove Ranch..... | Champion |
|-----------------------------------|------------------|----------|

### Class E—Herefords. BREEDING SECTION

- | Entry.                             | Name of Animal.                  | Exhibitor.        | Award. |
|------------------------------------|----------------------------------|-------------------|--------|
| 1. Aged bull.....                  | Bonnie Beau.....                 | H. W. Rice.....   | First  |
|                                    | Fascinator .....                 | H. W. Rice.....   | Second |
| 2. 2-year-old bull....             | Grand Duke.....                  | H. W. Rice.....   | First  |
| 3. Senior yearling bull..          | Choice Mixer....                 | Haleakala Rh..... | First  |
| 4. Junior yearling bull..          | Donald Joy.....                  | Haleakala Rh..... | First  |
|                                    | Bonnie Major....                 | H. W. Rice.....   | Second |
|                                    | Bonnie Admiral..                 | H. W. Rice.....   | Third  |
| 5. Senior bull calf....            | Don Woodford                     |                   |        |
|                                    | XIII .....                       | Haleakala Rh..... | First  |
|                                    | Mischief Expert..                | Haleakala Rh..... | Second |
|                                    | Bonnie Senator...H. W. Rice..... |                   | Third  |
| 6. Junior bull calf....            | Maui Paragon II..                | Haleakala Rh..... | First  |
|                                    | Richard Steinway..               | Haleakala Rh..... | Second |
| 7. Aged cow.....                   | Della Perfect....                | Haleakala Rh..... | First  |
|                                    | Iva's Sensation..                | Haleakala Rh..... | Second |
| 8. 2-year-old heifer...            | Coral .....                      | Haleakala Rh..... | First  |
| 9. Senior yearling<br>heifer ..... | Kula Girl.....                   | H. W. Rice.....   | First  |
|                                    | Duchess .....                    | H. W. Rice.....   | Second |
|                                    | Princess .....                   | H. W. Rice.....   | Third  |



10. Junior yearling  
heifer ..... Bonnie Lassie ... H. W. Rice ..... First  
Bonnie Lulu ..... H. W. Rice ..... Second
11. Senior heifer calf... Bonnie Bessie... H. W. Rice ..... First
12. Junior heifer calf... Bonnie Gay... Haleakala Rh. .... First  
Bonnie Bar... Haleakala Rh. .... Second  
Bonnie Priscilla... H. W. Rice ..... Third
14. Young herd ..... H ..... H. W. Rice ..... First
15. Calf herd ..... Haleakala Rh. .... First  
H. W. Rice ..... Second
16. Get of sire. .... H. W. Rice ..... First  
H. W. Rice ..... Second  
A special prize is awarded H. W. Rice for the 8  
animals entered, the get of Bonnie Beau.
17. Produce of dam. .... H. W. Rice ..... First  
Haleakala Rh. .... Second  
H. W. Rice ..... Third
- 17A. Cow with calf at  
foot ..... Della Perfect... Haleakala Rh. .... First  
Iva's Sensation.. Haleakala Rh. .... Second

## MARKET SECTION.

18. Pen of 3 fat steers,  
age limit 3 years..... Haleakala Rh. .... First
19. Pen of 3 fat steers,  
age limit 2 years..... H. W. Rice ..... First
21. Fat steers under  
3 years..... Charlie ..... H. W. Rice ..... First  
Harry ..... Haleakala Rh. .... Second  
Tom ..... Haleakala Rh. .... Third
22. Fat steers under 2  
years ..... Ringleader ..... H. W. Rice ..... First  
Maluhia ..... H. W. Rice ..... Second  
Choice Goods... H. W. Rice ..... Third

## CHAMPIONSHIPS.

24. Senior champion  
bull ..... Bonnie Beau... H. W. Rice ..... Champion
25. Senior champion  
cow ..... Della Perfect... Haleakala Rh. .... Champion
26. Junior champion  
bull ..... Choice Mixer... Haleakala Rh. .... Champion
27. Junior champion  
heifer ..... Kula Girl..... H. W. Rice ..... Champion
28. Grand champion  
bull ..... Choice Mixer... Haleakala Rh. .... Grand Chp.
29. Grand champion fe-  
male ..... Kula Girl..... H. W. Rice ..... Grand Chp.
30. Champion pen of 3  
fat steers..... H. W. Rice ..... Champion
31. Champion fat steer. Ringleader ..... H. W. Rice ..... Champion
32. Champion steerherd..... H. W. Rice ..... Champion
33. Grand champion  
steer herd ..... H. W. Rice ..... Champion
34. Reserved grand  
champion bull..... Bonnie Beau... H. W. Rice ..... Res.Gr.Ch.
35. Reserved grand  
champion female... Della Perfect... Haleakala Rh. .... Res.Gr.Ch.
37. Grand champion  
fat steer..... Ringleader ..... H. W. Rice ..... Grand Chp.
38. Reserved Gr. Cham-  
pion fat steer..... Charlie ..... H. W. Rice ..... Res.Gr.Ch.

**Class J.—Guernseys.**

2. 2-year-old bull.....	College of Hawaii..	First
24. Senior champion bull .....	College of Hawaii..	Champion
28. Grand champion bull .....	College of Hawaii..	Grand Chp.

**Class K.—Holsteins.**

Entry.	Name of Animal.	Exhibitor.	Award.
1. Aged bull.....	King K. P. T.....	Waialae Ranch....	First
	Deutschland W.	Kamehameha Sh..	Second
	B. King.....	Kula Sanitarium...	Third
2. 2-year-old bull.....	Wailuku Sug. Co..		First
4. Junior yearling bull.....	Charles Thompson.		First
5. Senior bull calf.....	Kamehameha Sch..		First
6. Junior bull calf.....	Kula Sanitarium..		First
7. Aged cow.....	Joletta .....	College of Hawaii..	First
	Lady James Regis.	H. C. & S. Co.....	Second
	Jennette Ormsley.	Kamehameha Sch..	Third
8. 2-year-old heifer.....	Kamehameha Sch..		First
	Kula Sanitarium...		Second
10. Junior yearling.....			
heifer .....	Kamehameha Sch..		First
	Kula Sanitarium..		Second
12. Junior heifer calf.....	Kamehameha Sch..		First
13. Aged herd.....	Kamehameha Sch..		First
	Kula Sanitarium..		Second
15. Calf herd.....	Kula Sanitarium..		First
16. Get of sire.....	Kamehameha Sch..		First
	Kula Sanitarium..		Second
	Grove Ranch.....		Third
17. Produce of dam.....	Kamehameha Sch..		First
	Kamehameha Sh..		Second
	Kula Sanitarium...		Third
17A. Cow with calf at foot .....	Kamehameha Sch..		First
	Kula Sanitarium..		Second
			and Special

**CHAMPIONSHIPS.**

24. Senior champion bull .....	Wailuku Sugar Co..	Champion
25. Senior champion cow .....	Joletta .....	College of Hawaii..
26. Junior champion bull .....	Kamehameha Sch..	Champion
27. Junior champion heifer .....	Kamehameha Sch..	Champion
28. Grand champion bull .....	Kamehameha Sch..	Grand Chp.
29. Grand champion female .....	Joletta .....	College of Hawaii..
34. Reserved grand champion bull.....	Wailuku Sugar Co..	Res.Gr.Ch.
35. Reserved grand champion female.....	Kamehameha Sch..	Res.Gr.Ch.

**Class L.—Jerseys.**

Entry.	Name of Animal.	Exhibitor.	Award.
1. Aged bull.....	Isenberg .....	Mrs. F. F. Baldwin.	First
	Crook .....	Mrs. F. F. Baldwin.	Second

- |                                     |                     |                          |
|-------------------------------------|---------------------|--------------------------|
| 3. Senior yearling bull.....        | Mrs. S. A. Baldwin. | First                    |
|                                     | H. D. Sloggett....  | Second                   |
| 5. Senior bull calf.....            | Rose E. Crook....   | First                    |
| 6. Junior bull calf.....            | Dr. W. D. Baldwin.  | First                    |
| 7. Aged cow.....                    | Mrs. F. F. Baldwin. | First                    |
|                                     | Daisy .....         | New Era Hd. Fm..Second   |
|                                     | Rose E. Crook....   | Third                    |
| 8. 2-year-old heifer...Nanny .....  | J. C. Fitzgerald..  | First                    |
|                                     | Daisy .....         | J. C. Fitzgerald..Second |
| 9. Senior yearling<br>heifer .....  | Mrs. S. A. Baldwin. | First                    |
| 10. Junior yearling<br>heifer ..... | Mary .....          | Mrs. S. A. Baldwin.      |
|                                     | Mrs. S. A. Baldwin. | First                    |
| 12. Junior heifer calf.....         | Rose E. Crook....   | First                    |

## CHAMPIONSHIPS.

- |   |                     |                     |
|---|---------------------|---------------------|
| 24. Senior champ. bull..Isenberg .....              | Mrs. F. F. Baldwin. | Champion            |
| 26. Junior champ. bull.....                         | Mrs. S. A. Baldwin. | Champion            |
| 27. Junior champion<br>heifer .....                 | Mary .....          | Mrs. S. A. Baldwin. |
|   | Mrs. S. A. Baldwin. | Champion            |
| 28. Grand champ. bull.....                          | Mrs. S. A. Baldwin. | Gr. Champ..         |
| 29. Grand champion<br>female .....                  | Mary .....          | Mrs. S. A. Baldwin. |
|   | Mrs. S. A. Baldwin. | Gr. Champ..         |
| 34. Reserved grand<br>champion bull.....            | Isenberg .....      | Mrs. F. F. Baldwin. |
|   | Mrs. F. F. Baldwin. | Res. Gr. Ch.        |
| 35. Reserved grand<br>champion female...Katie ..... | Mrs. S. A. Baldwin. | Res. Gr. Ch.        |

## HOGS.

Class M—Berkshires  
BREEDING SECTION.

- | Entry.   | Name of Animal.   | Exhibitor.         | Award. |
|--|-------------------|--------------------|--------|
| 1. Aged Boar .....   | King of Kewalo.   | H. W. Rice.....    | First  |
|  |                   | Kula Sanitarium .. | Second |
|  |                   | New Era Hd Fm...   | Third  |
| 2. Aged Sow .....  | Stumpy .....      | New Era Hd. Fm..   | First  |
|  | Riverby Princess. | H. W. Rice.....    | Second |
|  | Maui Lady.....    | H. W. Rice.....    | Third  |
| 3. Sr. yearling boar.....  |                   | Haleakala Rh. .... | First  |
| 4. Sr. yearling sow.....   |                   | H. W. Rice.....    | First  |
| 5. Jr. yearling boar.....  |                   | M. A. Co.....      | First  |
|  |                   | H. W. Rice.....    | Second |
| 6. Jr. yearling sow...Kaonoulu Girl II.  |                   | H. W. Rice.....    | First  |
|  | Kaonoulu Girl...  | H. W. Rice.....    | Second |
| 7. Senior boar pig.....  |                   | Honolua Ranch...   | First  |
| 9. Junior boar pig.....  |                   | H. W. Rice.....    | First  |
|  |                   | H. W. Rice.....    | Second |
|  |                   | H. W. Rice.....    | Third  |
| 10. Junior sow pig.....  |                   | H. W. Rice.....    | First  |
|  |                   | H. W. Rice.....    | Second |
|  |                   | H. W. Rice.....    | Third  |
| 11. Old herd .....   |                   | H. W. Rice.....    | First  |
| 12. Young herd .....   |                   | H. W. Rice.....    | First  |
|  |                   | H. W. Rice.....    | Second |
| 13. Herd (bred by or<br>farrowed the prop-<br>erty of exhibitor,<br>boar and 3 sows..... |                   | H. W. Rice.....    | First  |
|  |                   | H. W. Rice.....    | Second |
| 14. Get of sire.....   |                   | H. W. Rice.....    | First  |
|  |                   | H. W. Rice.....    | Second |

15. Produce of dam.....H. W. Rice.....First  
 16. Sow with litter.....New Era Hd. Fm...First

MARKET SECTION.

17. Pen of 3 pork pigs  
 up to 250 lbs.....Honolua Ranch....First  
 18. Barrow under 250  
 lbs. ....Haleakala Reh....First

CHAMPIONSHIPS.

- | Entry.                                   | Name of Animal.             | Exhibitor.        | Award.      |
|--|-----------------------------|-------------------|-------------|
| 20. Sr. champion boar..                  | King of Kewalo..            | H. W. Rice.....   | Champion    |
| 21. Sr. champion sow..                   | Stumpy .....                | New Era Hd. Fm... | Champion    |
| 22. Jr. champion boar..                  | Lee Duke of<br>Kewalo ..... | H. W. Rice.....   | Champion    |
| 23. Jr. champion sow..                   | Kaonoulu Girl II..          | H. W. Rice.....   | Champion    |
| 24. Grand Champ. boar.                   | King of Kewalo..            | H. W. Rice.....   | Gr. Champ.  |
| 25. Grand champ sow.....                 | New Era Hd. Fm...           |                   | Gr. Champ.  |
| 26. Reserved grand<br>champion boar..... | H. W. Rice.....             |                   | Res.Gr. Ch. |
| 27. Reserved grand<br>champion sow.....  | K. Girl II.....             | H. W. Rice.....   | Res.Gr. Ch. |

Class N—Durocs.

BREEDING SECTION.

- | Entry.  | Name of Animal.    | Exhibitor. | Award. |
|---|--------------------|------------|--------|
| 1. Aged boar.....   | Honolua Ranch....  |            | First  |
|   | Wailuku Sug. Co... |            | Second |
| 2. Aged sow.....  | H. C. & S. Co..... |            | First  |
|   | H. C. & S. Co..... |            | Second |
|   | H. C. & S. Co..... |            | Third  |
| 3. Sr. yearling boar.....   | H. C. & S. Co..... |            | First  |
|   | P. Cockett .....   |            | Second |
| 4. Sr. yearling sow.....  | P. Cockett .....   |            | First  |
| 5. Jr. yearling boar.....   | Asa Baldwin.....   |            | First  |
| 6. Jr. yearling sow.....  | Lawrence Baldwin.  |            | First  |
|   | Honolua Ranch....  |            | Second |
| 7. Senior boar pig.....   | H. C. & S. Co..... |            | First  |
|   | H. C. & S. Co..... |            | Second |
|   | H. C. & S. Co..... |            | Third  |
| 8. Senior sow pig.....  | H. C. & S. Co..... |            | First  |
|   | H. C. & S. Co..... |            | Second |
|   | H. C. & S. Co..... |            | Third  |
| 9. Junior boar pig.....   | H. C. & S. Co..... |            | First  |
|   | H. C. & S. Co..... |            | Second |
|   | Honolua Ranch....  |            | Third  |
| 10. Junior sow pig.....   | H. C. & S. Co..... |            | First  |
|   | H. C. & S. Co..... |            | Second |
| 11. Old herd.....   | H. C. & S. Co..... |            | First  |
| 12. Young herd.....   | H. C. & S. Co..... |            | First  |
| 13. Herd bred by or<br>farrowed the prop-<br>erty of exhibitor,<br>boar and 3 sows..... | H. C. & S. Co..... |            | First  |
| 14. Get of sire.....  | H. C. & S. Co..... |            | First  |
| 15. Produce of dam.....   | H. C. & S. Co..... |            | First  |
| 16. Sow with litter.....  | H. C. & S. Co..... |            | First  |
|   | P. Cockett.....    |            | Second |

MARKET SECTION.

17. Pen of 3 pork pigs  
 up to 250 lbs.....Honolua Ranch....First  
 H. C. & S. Co.....Second



18. Barrow under 250  
lbs. .... Honolulu Ranch....First  
H. C. & S. Co.....Second
19. Barrow over 250  
lbs. .... Honolulu Ranch....First  
H. C. & S. Co.....Second  
H. C. & S. Co.....Third

## CHAMPIONSHIPS.

20. Sr. champion boar.....H. C. & S. Co.....Champion  
21. Sr. champion sow.....H. C. & S. Co.....Champion  
22. Jr. champion boar.....H. C. & S. Co.....Champion  
23. Jr. champion sow.....H. C. & S. Co.....Champion  
23A. Champion barrow.....Honolulu Ranch....Champion  
24. Grand champ. boar.....H. C. & S. Co.....Gr. Champ.  
25. Grand champ. sow.....H. C. & S. Co.....Gr. Champ.  
26. Reserved grand  
champion boar.....H. C. & S. Co.....Res.Gr.Ch.  
27. Reserved grand  
champion sow.....H. C. & S. Co.....Res.Gr.Ch.

## Class P.—Poland Chinas.

## BREEDING SECTION.

1. Aged boar.....Grove Ranch.....First

## Class Q.—Tamworths.

## BREEDING SECTION.

1. Aged boar.....Pioneer Mill Co....First  
2. Aged sow.....Pioneer Mill Co....First  
16. Sow with litter.....Pioneer Mill Co....First

## Class S—Sheep and Goats.

- | Entry.                         | Exhibitor.              | Name of Animal.    | Award. |
|--------------------------------|-------------------------|--------------------|--------|
| 17. Milking goat exhibit ..... |                         | Fred Krause Jr.... | First  |
|                                |                         | Noel Krauss.....   | Second |
|                                |                         | J. Bechert.....    | Third  |
| 20. Special entry.....         | King of Kahoolawe ..... | Kahoolawe Ranch..  | First  |
|                                |                         | H. W. Rice.....    | First  |
|                                |                         | H. W. Rice.....    | Second |
|                                |                         | H. W. Rice.....    | Third  |

## Class T—Special, Miscellaneous.

2. Four-day butter-fat  
production contest.....College of Hawaii..First  
Kula Sanitarium..Second
3. Cow with highest  
A. R. O. or R. M.  
record .....College of Hawaii..First
6. Carcass contest....Jim .....Grove Ranch.....First  
Harry .....Haleakala Ranch..Second  
Choice Goods.....H. W. Rice.....Third
7. Special prize for  
best kept exhibit.....Kamehameha Sch..First
8. Special prize for  
best exhibit.....H. W. Rice.....First

## By Authority

### TERRITORY OF HAWAII BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY

#### Further Amendment to Rule I of the Division of Plant Inspection of the Board of Commissioners of Agriculture and Forestry.

The Board of Commissioners of Agriculture and Forestry of the Territory of Hawaii hereby further amends Rule I of the Division of Plant Inspection to read as follows:

"Section 1. For the purpose of preventing the introduction into the Territory of Hawaii of fruit flies and insects, their eggs, larvae or pupae, and all diseases of plants, fruits, or other vegetation of value, all persons, companies and corporations are hereby prohibited from introducing, importing or bringing, in baggage or otherwise, into the Territory of Hawaii, or into any of its ports for the purpose of debarkation into the said Territory, any fresh fruit from East or West Indies, Asia, Australasia, Oceania, Malaysia, Mexico, Central and South America; provided, however, that fresh apples may be imported into the Territory of Hawaii direct from New Zealand in cold storage only, if they are free from insect pests and plant diseases, and are accompanied by a government certificate declaring that the apples have been grown in New Zealand and are shipped free from insect pests and plant diseases, and are also accompanied by a government certificate declaring that they have not and will not come in contact with Australian fruit on the voyage to the Territory of Hawaii."

"Section 2. (a) Provided that a special permit has been granted by the Federal Horticultural Board of Washington, D. C., in accordance with its Form 207-3, and further provided that such permit is actually in the possession of the Chief Plant Inspector of the Territory of Hawaii at the time of entry, only bona-fide "Novelties," consisting of plants not of a succulent nature, if free from sand, soil or earth; scions and buds of trees; rose stocks for propagation; nuts, including palm seeds, for propagation; seeds of fruit, forest, ornamental and shade trees; seeds of deciduous and evergreen ornamental shrubs and of hardy perennial plants, may be imported into the Territory (through the port of Honolulu only) from any foreign country. All such importations, however, at the time of their entry for introduction shall be subjected to inspection and examination by the Chief Plant Inspector or his assistants and if found attacked by plant diseases, insect pests or their larvae, shall be seized and immediately burned. The Chief Plant Inspector may in his discretion and as a precautionary measure, fumigate any or all importations as aforesaid. Provided, however, that lily bulbs, lily of the valley, narcissus, hyacinths, tulips, and crocus may be imported into the Territory of Hawaii from Europe only, and narcissus and liliums may be so imported from Japan and China only after the necessary permit has been obtained for such importation from Europe, China, or Japan, from the Federal Horticultural Board of Washington, D. C., and all plant products to be used for medicinal, food, or manufacturing purposes may be imported into the Territory from any state, territory, or foreign country, subject, however, to all the conditions as to inspection and freedom from pests as hereinbefore provided.

(b) For the purpose of this Rule wherein it governs plant importations from foreign countries, the definition of "Plant Novelties" (not including succulent plants as aforesaid) and of "Propagating Stock" shall be in accordance with the "informational data" given by the Federal Horticultural Board of Washington, D. C., in its said Form 207-3.

(c) All persons and corporations are hereby prohibited from removing or taking or attempting to remove or take, any of the articles aforementioned from either ship, wharf or landing place without first having notified the Division of Plant Inspection of the arrival of said article or

articles and having received written permission from the duly authorized officer to remove or take same.

Section 3. All fruits, vegetables, plants, parts of plants, bulbs, roots or tubers, seeds, grains or cereals from the United States of America and the Dominion of Canada that are not prohibited under rules and regulations of the Federal Horticultural Board of Washington, D. C., may be introduced, imported or brought into the Territory of Hawaii either by freight, express or as packages of passengers, provided, however, that all such fruits, vegetables, plants, parts of plants, bulbs, roots, seeds, grains and cereals are free from pests and diseases. All persons importing, introducing, or bringing into the Territory of Hawaii any fruits, vegetables, plants or parts of plants, bulbs, roots or tubers, seeds, grains and cereals must present the same to or notify the Chief Plant Inspector of the Board of Agriculture and Forestry before landing any of these articles.

Section 4. If any fresh fruits, vegetables, plants, cuttings, scions, buds, bulbs, roots or tubers, seeds, grains or cereals shall be imported, introduced or brought in baggage or otherwise into the Territory of Hawaii, or into any of its ports for the purpose of debarkation into said Territory, contrary to law or this regulation, the same shall, in the discretion of the Board of Commissioners of Agriculture and Forestry or its duly authorized agent, officer or inspector, be immediately seized and destroyed or deported at the expense of the importer or introducer, and the person or persons or corporation introducing or importing the same shall be guilty of a misdemeanor and shall be liable to the penalty or penalties provided by law.

Section 5. This rule, as amended, shall take effect upon its approval by the Governor.

Approved this 31st day of October, 1919.

C. J. McCARTHY,  
Governor of Hawaii.

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